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THIRD BIENNIAL REPORT
OF THE
STATE ENGINEER
STATE OF SOUTH DAKOTA
1909-1910

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THIRD

BIENNIAL REPORT

— OF THE —

STATE ENGINEER

— TO THE —

GOVERNOR OF SOUTH DAKOTA—

FOR THE YEARS

1909-1910

NEWS PTG. CO., ABERDEEN, S. D.

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SAMUEL H. LEA
STATE ENGINEER
PIERRE, S. D.

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LETTER OF TRANSMITTAL

Pierre, South Dakota, October 22, 1910.

Hon. R. S. Vessey,
Governor of South Dakota.

Sir: In accordance with the provisions of Section 9, Chapter 180 of the Session Laws of 1907, I have the honor to submit herewith a report of the work of this department during the past two years, together with such recommendations as in my judgment will increase the efficiency of the water laws and improve the administration thereof.

Respectfully,

SAMUEL H. LEA,
State Engineer.

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LIST OF OFFICERS IN CHARGE OF PUBLIC WATERS IN SOUTH DAKOTA

Samuel H. Lea, State Engineer.....Pierre
S. Rex Green, Assistant State Engineer.....Philip
W. L. Barbour, Commissioner of Water Division No. 1.....Belle Fourche
Samuel H. Lea, Acting Commissioner of Water Division No. 2....Pierre

Field Assistants

Roy Acheson .....Rodman
B. F. Wallace.....Rodman

Office Assistants

B. B. Lea .....Recording Clerk
Elizabeth Swanson .....Stenographer

Board of Water Commissioners

Samuel H. Lee, State Engineer, President.....Pierre
W. L. Barbour, Secretary..... ....Belle Fourche
Samuel H. Lea, Acting Water Commissioner.....Pierre

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BOUNDARIES OF WATER DIVISIONS

Water Division No. 1—Comprises Butte, Meade, Perkins and Harding counties.

Water Division No. 2—Comprises all counties west of the Missouri river except Butte, Meade, Lawrence, Perkins and Harding counties.

Water Division No. 3—Comprises all counties east of the Missouri river.

BOUNDARIES OF WATER DISTRICTS

Little Missouri Water District—Includes watershed of Little Missouri river and tributaries in Butte and Harding counties.

Grand River Water District—Includes watershed of Grand river and tributaries in Harding and Perkins counties.

Moreau River District—Includes watershed of Moreau river and tributaries in Butte, Harding and Perkins counties.

Sulphur Creek Water District—Includes watershed of Sulphur creek and tributaries in Butte and Meade counties.

Belle Fourche Water District—Includes watershed of Belle Fourche river and tributaries in Lawrence, Butte and Meade counties.

Elk Creek Water District—Includes watershed of Elk creek, also such portions and tributaries of Box Elder and Rapid creeks as are in Meade and Lawrence counties.

WATER DIVISION NO. 2

Rapid Creek Water District—Includes the watersheds of Rapid and Box Elder creeks and tributaries in Pennington county.

Battle Creek Water District—Includes the watersheds of Battle, French and Spring creeks and their tributaries.

Fall River Water District—Includes the watersheds of tributaries on north side of Cheyenne river in Fall River county, and south of Custer and Fairburn in Custer county.

South Cheyenne Water District—Includes tributaries on south side of Cheyenne river in Fall River county.

East Cheyenne Water District—Includes tributaries on south side of Cheyenne river in Pennington and Stanley counties.

Bad River Water District—Includes watershed of Bad river.

White River Water District—Includes the watersheds of tributaries on north side of White river in Pennington, Lyman and Stanley counties.

WATER DIVISION NO. 3

Big Sioux Water District—Includes entire watershed of Big Sioux river within the state boundary.

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FINANCIAL STATEMENT OF STATE ENGINEER FOR THE FISCAL YEAR ENDING JUNE 30, 1909

Office Appropriations

For salary of State Engineer	$2,000.00
For salary of Assistant Engineer	1,500.00
For salary and expense of Water Commissioners, field assistants and clerk hire	2,900.00
For instruments, office supplies and other expenses	2,600.00
Total	$9,000.00

Office Disbursements

Salary of State Engineer	$2,000.00
Salary of Assistant Engineer	1,408.33
Reverted to treasury	91.67
Salary and expense of Water Commissioners, etc	2,900.00
Instruments, office supplies, etc	1,797.73
Reverted to treasury	334.44
Total	$9,000.00

Receipts of State Engineer's Office

Fees for quarter ending September 30, 1908	$ 141.30
Fees for quarter ending December 31, 1908	127.10
Fees for quarter ending March 31, 1909	110.20
Fees for quarter ending June 30, 1909	211.90
Total	$ 590.50

Deposited With State Treasurer

October 6, 1908	$ 141.30
January 8, 1909	127.10
April 4, 1909	110.20
July 6, 1909	211.90
Total	$ 590.50

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FINANCIAL STATEMENT OF STATE ENGINEER FOR THE FISCAL YEAR ENDING JUNE 30, 1910

Office Appropriations

For salary of State Engineer	$2,000.00
For salary of Assistant Engineer	1,500.00
For salary and expenses of Water Commissioners and field assistants	2,700.00
For instruments, office supplies, clerk hire and expenses	1,800.00
Total	$8,000.00

Office Disbursements

Salary of State Engineer	$2,000.00
Salary of Assistant Engineer	1,500.00
Salary and expenses of Water Commissioners, etc.	1,659.30
Reverted to treasury	1,040.70
Instruments, office supplies, etc.	1,797.73
Reverted to treasury	2.27
Total	$8,000.00

Receipts of State Engineer's Office

Fees for quarter ending September 30, 1909	$ 203.60
Fees for quarter ending December 31, 1909	172.80
Fees for quarter ending March 31, 1910	179.60
Fees for quarter ending June 30, 1910	141.30
Total	$ 697.30

Deposited With State Treasurer

October 4, 1909	$ 203.60
January 3, 1910	172.80
April 4, 1910	179.60
July 5, 1910	141.30
Total	$ 697.30

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Report of State Engineer

INTRODUCTION

Since presenting the Second Biennial Report of this department two years ago, the work of the State Engineer and his assistants has greatly increased in volume and widened considerably in scope. While the department has not yet emerged from the formative period, the experience already undergone has demonstrated the value to the state of a technical department, capable of handling the problems incident to the material development of a young and vigorous commonwealth.

At the present time the majority of the states west of the Missouri river have state engineers who are charged with the administration of laws relating to the regulation of appropriations of water for beneficial purposes. South Dakota, however, is the only state whose engineer has official duties relating to both irrigation and drainage.

The volume of business in this department has continued to increase during the last two years in even greater ratio than in the years preceding. At the present time the official work is sufficient in volume to require the entire time of the State Engineer and of his small force of specially trained assistants. In fact, additional help is needed now to properly care for the demands from various places in the state for the official services of the State Engineer.

The increase in the work and the importance of this department is substantial evidence of the growing prosperity of the state, especially along the lines of agricultural and industrial development.

The development of our natural resources is being carried forward rapidly. Two large water power plants are under construction in the Black Hills, and others are projected. The appropriation of water for power purposes in South Dakota is under the control of the state, the same as for irrigation or other beneficial uses. All such appropriations are made in accordance with the provisions of the State Water Code under permits issued by the State Engineer.

The scope of this department has been greatly enlarged beyond original limitations by the addition of duties not contemplated at the time of its establishment. The general supervision by the State Engineer of drainage work in the state is a new duty, imposed by the legislature of 1909. This work bids fair to exceed in amount any other single duty of the department.

Another official duty required of the State Engineer comprises serving as a member of a commission for platting the grounds and designating

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sites for new buildings of the various charitable and penal institutions of the state.

In addition to the above, the State Engineer personally supervised the grading of the new capitol grounds at Pierre, drawing plans, furnishing grades and centers, and making estimates of work done by the contractor.

In one or two instances the State Engineer has been consulted on matters relating to the safety and stability of structures belonging to state institutions.

From the foregoing it will be seen that the State Engineer has been kept quite busy with his official duties. The entire force of assistants have also been busy, the department taking care of a large amount of work.

The appropriation for maintaining this department that was made by the legislature of 1907 was adequate for its needs at that time. It was used sparingly, because of lack of experience in expenditure for such work. In one item there remained a considerable unexpended balance at the end of the fiscal year; this reverted to the state treasury.

The legislature of 1909 cut down the appropriation for this department considerably below that of the preceding session. The result has been that the work has been hampered considerably because of lack of funds to employ the necessary help. It is hoped that the legislature of 1911 will be more liberal.

The work of making hydrographic surveys of streams in the state is being carried on in a systematic manner. All the funds available for this work during the present year will be used and more could be used to advantage.

The hydrographic survey work, as required by the Water Code, is now being actively carried on under the personal supervision of the assistant state engineer in the field. He has a small field party employed, which keeps steadily at work throughout the season.

The continued increase in the work of the State Engineer's office requires an increased amount of clerical work and also a large volume of correspondence. Many inquiries concerning agricultural, climatic and physical conditions obtaining in South Dakota have been received from many localities. In all such cases the letters have been promptly answered, and, where possible, the information requested has been furnished.

The fact that the State Engineer has been requested to furnish information and advice upon such a variety of subjects indicates the appreciation of the people of the state for a central source of information upon technical matters of public interest.

A list of the subjects concerning which this office has furnished advice and information upon special request comprises the following:

Water Power, Drainage, Artesian Wells, Dry Farming, Good Roads, Building Construction. These are all more or less correlated as pertaining to the general welfare.

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In addition to the duties that have been designated, the State Engineer devoted part of his time to farmers' institute work, in co-operation with the regular farmers' institute field force.

In this report the effort will be made to discuss in a clear and comprehensive manner all matters to which especial consideration has been given by this department.

LAWS GOVERNING THE CONTROL AND USE OF WATER

Prior to the year 1905 there was no state supervision of flowing streams in South Dakota, and local customs were followed in the matter of appropriating water for beneficial purposes. In the western part of the state considerable placer mining was done in the gulches and along the streams in the Black Hills. Such operations required the use of flowing water in most instances, and in such cases the appropriation could be made by posting a notice on a post or tree at or near the point of diversion. In some instances a copy of the notice was filed at the court house of the county in which the appropriation was made, and the appropriation thus became a matter of record. Most of these placer workings have been abandoned, and the water rights in such cases have lapsed through non-use. In this way the records show a large number of appropriations of water which are no longer valid, but which will require careful investigation to separate from those remaining in full force and effect.

The state laws authorized appropriations of water in the manner described, and the general custom of the country permitted appropriators to place on record such claims to the water supply as they deemed advisable. The natural tendency was to make the claim large enough to cover all possible requirements, and in most cases greater than there was any expectation of using. This resulted in many instances in absurd and speculative claims, and the records show numerous cases where each of a number of claims to water of a stream, filed in accordance with the former statutes, involved a larger quantity of water than had ever flowed in it, even during flood periods. One provision of the former statutes permitted the acquirement of a water right by usage, and an appropriator under such circumstances was entitled to the enjoyment of such a quantity of water as he actually applied to beneficial use. Such water rights acquired under the old state water laws as have been kept alive are recognized as valid and of full force and effect. The keeping alive of a water right consisted in making beneficial use of the water claimed during a portion, at least, of each year, and failure to use the water for a period of two successive years constituted abandonment.

In 1905 South Dakota adopted a code of water laws, providing for the adjudication of existing rights and the complete public control of the water supply in the future. The office of the state engineer was created, and to the engineer was given general supervision of waters of the state and of the measurement and appropriation thereof. This law was amended and re-enacted in 1907, so as to make it applicable to

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all beneficial uses of water without limiting its application to irrigation alone.

The previous law of South Dakota, as above stated, provided for posting and filing notices, as did the laws of other states, and the State Engineer has secured from the county officers copies of all such notices. The records shown nothing as to what was done under these notices, but the Engineer has examined the locations covered by a number of them, and found that nothing has been done under these particular ones. Under the present state water law the State Engineer is empowered to make all necessary general rules and regulations to carry into effect the duties devolving upon the office.

DEFINING WATER RIGHTS

The provisions of the Water Code require the State Engineer to make hydrographic surveys and investigations of the various stream systems and sources of water supply in the state, beginning with those most used for irrigation, obtaining and recording all available data for the determination, development and adjudication of the water supply of the state; including the location and survey of suitable sites for dams and reservoirs and the determination of the approximate water supply, capacity and cost of each.

In case of a suit for the determination of water rights, all who claim rights to the same source may be made parties, and the court is authorized to call upon the State Engineer to furnish a complete hydrographic survey of the stream, and to obtain all data necessary for a determination of the rights. The costs of the suit, including all work done by the State Engineer, are to be charged to the parties in proportion to the amount of water to which rights are allotted them. For the purpose of meeting these expenses an appropriation of $1,000 was made, to be replenished by the money collected from the parties, thus becoming a permanent revolving fund. Upon the completion of an adjudication the clerk of the court is to make two certified copies of the decree, one to be filed in the office of the State Engineer and the other in the office of the water commissioner of the water division in which the stream is situated. Such decree shall in every case declare as to the water right adjudged to each party, the priority, amount, purpose, place of use, and, as to water used for irrigation, the specific tracts of land to which it shall be appurtenant, together with such other conditions as may be deemed necessary to define the right and its priority.

ACQUIREMENT OF WATER RIGHTS

Any party hereafter wishing to acquire a right to use water must make application to the State Engineer for a permit, giving all the data necessary for the proper description and limitations of the rights applied for, together with such maps, plans and specifications as are necessary to show the method and practicability of the construction and the ability of the applicant to complete the same. These maps, plans and specifications are to be filed in duplicate, the original to be retained in the

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office of the State Engineer, and the copy to be returned after approval to applicant, with suitable endorsement thereon. The application may be returned to applicant for correction or addition if defective in form or unsatisfactory as to the plan. Notice of application must be published at the expense of applicant, and interested parties may be heard for or against the granting of the application. The State Engineer may reject applications if there is no unappropriated water in the source of supply, or if, in his opinion, their approval would be contrary to public interest; but any applicant may appeal from this decision to the court.

An approved application becomes a permit, and in his approval the State Engineer designates the time within which the construction shall be completed, not exceeding five years, and the time within which the water shall be applied to beneficial use, not exceeding four years after the date of completion. One-fifth of the work must be done within half of the time allowed for completion, and in case of failure the State Engineer may issue other permits for the same supply. The Engineer, however, may extend the time allowed the original applicant, but only on account of delays due to physical or engineering difficulties which could not have been reasonably anticipated, or by operation of law beyond the power of the applicant to avoid.

On or before the date set for completion the Engineer is to inspect the works to determine their capacity, safety and efficiency. He may require changes, and shall not issue his certificate of completion until such changes are made. When the works are completed the State Engineer shall issue a certificate of completion, setting forth the capacity of the works and such limitations upon the right as are warranted by the conditions of the works, but in no manner exceeding the rights described in the permit.

On or before the date set for the application of the water to a beneficial use, the engineer shall again inspect the works, and after the inspection shall issue a license to appropriate water to the extent of the actual application thereof to a beneficial use. The inspection for the completion of the works and that for the application of the water to a beneficial use may be made at the same time if the owner of the permit wishes this to be done. Any permit or license to appropriate water may be assigned, but no assignment is binding except upon the parties thereto unless it is filed in the office of the State Engineer.

DISTRIBUTION OF WATER

For the distribution of water the state is divided into three divisions, for each of which there is a water commssioner. In the event of a temporary vacancy in the office of water commissioner, the powers and duties of such water commissioner shall devolve on the State Engineer until the office has been regularly filled. These commissioners and the State Engineer form a state board of water commissioners, which is to have general supervision of the distribution of water. The

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Engineer may make rules governing distribution, but these may be revised by the board of water commissioners. The divisions are divided into districts, which are designated by name and comprise as far as possible one or more distinct stream systems in each district. Any one may appeal from any act or decision of a water commissioner to the State Engineer, from whom appeal may be had to the courts. The water commissioners are appointed by the governor to serve six years, subject to removal by the governor, and receive $5.00 per day for the time actually engaged in official duties, but not exceeding 100 days in any one year. This is paid by the state.

FEES

The fees collected by the Engineer are turned into the state treasury. The fees allowed are as follows:

For filing and examining an application for permit to appropriate water, map and field notes of same, which shall include the filing of proofs of publication and all other papers relating to the application up to the recording of a permit to appropriate water, $5.00. For recording any permit, certificate of construction or license issued, or any other water right instrument, $1.00 for the first hundred words, and 15 cents for each additional hundred words or fraction thereof. For filing any other paper, $1.00. For issuing certificates of construction or licenses to appropriate water, $1.00 each. For making copy of any document recorded or filed in his office, 15 cents for each hundred words or fraction thereof. For blue print copy of any map or drawing, 10 cents per square foot or fraction thereof. For other copies of drawings, actual cost of work. For certifying to such copies, $1.00 for each certificate. For examining, in connection with water right applications, plans and specifications for any dam not exceeding ten feet in extreme height from the foundations, $10.00; for a dam higher than ten and not exceeding thirty feet, $20.00; for a dam higher than fifty feet, $50.00; for a canal or other water conduit of an estimated capacity exceeding fifty and not more than one hundred cubic feet per second, $30.00. For inspecting dam sites and construction work when required by law, or when necessary in the judgment of the State Engineer, $10.00 per day and actual and necessary traveling expenses. The fees for any inspection deemed necessary by the State Engineer and not paid on demand, shall be a lien on any land or other property of the owner of the works, and may be recovered by the State Engineer in any court of competent jurisdiction. For rating ditches or inspecting plans and specifications of works for the diversion, storage and carriage of water, at the request of private parties, not in connection with an application for right to appropriate water, actual cost and expenses; and the State Engineer shall attach his approval to such plans and specifications if found satisfactory. For such other work as may be required of his office, the fees provided by law.

CANALS AND DITCHES

Ditch owners are required to put in headgates and measuring devices, of designs approved by the State Engineer, at places determined by them,

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and in case these structures are not put in within twenty days after notice from the Engineer, the water commissioner may refuse to deliver water to the ditch. Taking water under these circumstances is made a misdemeanor. Interfering with any dam, headgate, weir, or other structure, or with any person lawfully distributing water, is also a misdemeanor.

The owner or owners of any works for the storage, diversion or carriage of water, which contain water is excess of their needs for irrigation or other beneficial use for which it has been appropriated, shall be required to deliver such surplus, at reasonable rates for storage or carriage, or both, as the case may be, to the parties entitled to the use of the water for beneficial purposes. In the case of the refusal of such owner or owners to deliver any such surplus water at reasonable rates as determined by the State Engineer, they may be compelled to do so by the circuit court for the county in which the surplus water is to be used.

DRY DRAW FILINGS

Section 31 of the 1907 Water Law provides that: "Any person, association or company who may have or hold any possession, right or title to any agricultural lands within the limits of this state shall be entitled to the usual enjoyment of the waters of the streams or creeks in said state and, for the purposes of directing flood waters for irrigation or for stock purposes, any persons, association or company may build or construct dams across any dry draw or water course within the state, and such person, association or company shall have the right of way through and over any tract or piece of land for the purpose of conveying said water by ditch or flume."

A further provision of this section requires all who wish to avail themselves of the rights above mentioned to file a location certificate with the register of deeds of the county in which the right is situated; a copy of such certificate to be posted at or near the head of the ditch or flume, having thereon the name of the locator, the date of location, the amount of water claimed, and the purposes for which it is to be used, and a copy of said notice to be mailed to the State Engineer.

Another provision of this section requires any appropriator thereunder to build and construct the dam within sixty days after the posting of the notice, and to proceed with due diligence to divert the waters for beneficial purposes.

A final provision says: "The words 'dry draw' or 'water course' used herein are defined to mean any ravine or water course not having a flow of at least twenty miner's inches of water, flowing during the greater part of the year. Any person or persons, association or company holding a right under section 31 of this act shall not be subject to the rules or regulations of the State Engineer or under his jurisdiction."

This section of the water law was intended to allow settlers or land owners to construct reservoirs for impounding storm water on their own land without having to go to the expense of making surveys and maps, and submitting an application in regular form for a permit from the

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State Engineer. Many filings have been made under the provisions of this section; a large proportion of these comprised filings under the Desert Land Act.

WATER RIGHTS

The State Water Code is based upon the principle, declared in section 1, that "All the waters within the limits of the state from all sources of water supply belong to the public and, except as to navigable waters, are subject to appropriation for beneficial use." Section 2 states specifically that "Beneficial use shall be the basis, the measure and the limit of the right to the use of water, that all water used for irrigation purposes shall be appurtenant to specified lands owned by the persons claiming the right to use the water, so long as it shall be practicable to beneficially or economically use the water thereon. Priority in time shall give the better right."

Since there is much difference of opinion as to the character and value of a permit to appropriate water, commonly called a water right, a statement will be made of the procedure adopted by the State Engineer's office to be followed when an application for a permit is received. Under the provisions of the state water law and the regulations established thereunder by the State Engineer, the various steps to be followed in making an appropriation of water for beneficial use are as follows:

1. **Application**—The applicant should obtain instructions and blank forms from the State Engineer. The form should be properly filled out and sent to the State Engineer, together with a fee of $5.00, for each separate application; this fee is for filing and examining the application, and for filing proof of publication. When required, fees to cover the charges for examining and approving plans and specifications for dams, in connection with water right applications, and for inspecting dam sites and construction work when required by law, must also be sent to the State Engineer before any decisive action will be taken by him. The State Engineer will then examine the application and if, in his opinion, the provisions of the law are not duly complied with, he will return the application for correction, informing the applicant concerning any additions or corrections that are to be made. The applicant should carefully note all the requirements designated in the instructions obtained from the State Engineer, since these must be complied with before the application can be accepted.

2. **Publication of Notice**—When the application is in proper form the State Engineer will instruct the applicant to publish a notice of his intention in a newspaper of general circulation in the stream system, once a week for four consecutive weeks. The State Engineer will furnish the proper forms for notices when he issues the instructions, specifying the paper in which the notice is to be published, the applicant, however, stating his choice of newspaper. A form for proof of publication will also be furnished to the applicant; this must be filled out and filed in

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the office of the State Engineer within sixty days of the date of his instructions, as provided by law.

3. **Consideration of Application**—Upon the receipt of the proofs of publication the State Engineer will give his consideration to the application, and will decide, in view of all available evidence, whether the application should be accepted or rejected. If he concludes that it should be accepted, he will give it his provisional approval. He will then notify the applicant of such acceptance, informing him as to the fees necessary for recording, as provided by law. The amount necessary to pay this charge must be forwarded so as to reach the office of the State Engineer within thirty days of such notification, and in this event the State Engineer will record the application with his approval thereof in a book provided for the purpose, granting through this act a permit to construct the proposed works as above approved, this permit being given a permanent number, all permits in a single water division being numbered consecutively. He will then notify the applicant of his action, sending him the permit, thus authorizing him to proceed with the work of construction. If the fees required for making the record are not received within thirty days, as provided for herein, the permit will not be recorded until such time as they are received, the right in that case not relating back to the time of application, but only to the time of the receipt of the fees.

The State Engineer may reject an application, as provided by law, in case he decides that the proposed appropriation would be detrimental to the public welfare. In such case he will file the papers in the case, notifying the applicant of his action.

4. **Due Diligence**—The work shall be diligently prosecuted and, prior to or upon the expiration of one-half of the entire time allowed in the permit, the appropriator shall demonstrate to the satisfaction of the State Engineer that one-fifth of the total amount of work has been done as required. Here, as in all other cases of failure to comply with the requirements of the law, if this amount of work is not completed the applicant may lose his priority. On or before the date set for the completion of the work, the applicant shall likewise demonstrate that the work has been completed in accordance with the terms of the permit. When, for good and sufficient reasons, it has been impracticable to complete the work within the time limit fixed in the permit, such reasons should be stated in an affidavit to be filed with the State Engineer.

5. **Beneficial Use**—The claim does not become an actual right until the water is actually and beneficially used, and a license therefor is issued by the State Engineer. On or before the date set for the application of the water to a beneficial use the State Engineer shall cause the works to be inspected, after due notice to the owner of the permit. Upon the completion of such inspection the State Engineer shall issue a license to appropriate water to the extent and under the conditions of the actual application thereof to a beneficial use.

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Instructions

Detailed information and instructions relative to the proper method of procedure required in making application for a permit to appropriate water have been prepared by the State Engineer. These instructions have been issued in the form of a circular, a copy of which will be forwarded upon request to those who are interested in such matters.

Blank Forms

In compliance with the requirements of the Water Code, the State Engineer has prepared official blank forms concerning the acquirement of water rights. Such a series of forms has been printed, copies of which are shown herewith:

Form 1—Letter Transmitting Forms

Form 1—Letter Transmitting Forms No.....

STATE OF SOUTH DAKOTA

Office of

STATE ENGINEER

.....190.....

.....

.....

.....

.....

In accordance with your request of.....190....., I am sending you.....blank form No..... as requested and also.....

Please study the instructions carefully, as prompt and thorough compliance with them may save a great deal of time and trouble. Your attention is directed particularly to.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Very respectfully,

.....

State Engineer.

By.....

Deputy.

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Form 2—Application for Permit to Appropriate Water, Original

Form 2—Application for Permit to Appropriate Water—Original

No.....

Water Division No..... .....District.

[Blanks to be Filled by the State Engineer]

APPLICATION FOR A PERMIT

To Appropriate Water Within the State of South Dakota

[Note—Draw a line through items not applicable]

1. Name of applicant.....
   Postoffice address....., County....., State.....
   I. If a corporation: .....
      (a) Name of same.....
      (b) Date and place of incorporation.....
      (c) Amount of capital stock.....
      (d) Amount paid in.....
      (e) Names and addresses of directors:

.....

.....

.....

[Note—A certified copy of articles of incorporation must accompany the application]

   II. Method of accomplishing the work and financial resources of the applicant:
      (a) Method of accomplishing the work. (Whether by contract, employment of others or by direct labor).....
      (b) Cash on hand, $..... (c) Treasury stock, $.....
      (d) Bonds to be issued, $..... (e) Other resources, $.....
2. Name of diversion works.....
3. Quantity of water claimed.....cubic feet per second.
4. Source of water supply.....
5. Location of point of diversion.....
..... on ..... bank.
(Right or left bank looking down stream)
6. Annual periods during which water is to be used.....
7. To be used for:
   I. Irrigation or domestic use:
      (a) Number of acres to be irrigated.....acres.
      (b) Legal subdivisions to be irrigated.....

Note—A list of lands to be irrigated, giving each subdivision and fraction with acreage thereof, should be written here, or may be appended as a part of this application. Same must also be shown on accompanying map.

      (c) Statement as to domestic use (giving location, etc.).....

.....

   II. Mining, power, manufacturing, transportation, or other purposes:
      (a) Nature of use.....

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(b) Amount of power to be generated.....horse power.
(c) Location of plant.....
(d) Method of developing power.....
(e) Point where water will be returned to stream.....

8. Estimated cost of works:
(a) Head gates, $..... (b) Pumping plant, $.....
(c) Fluming, $..... (d) Canal-earth, $..... Rock, $.....
(e) Other structures.....$..... Total, $.....

9. Description of diversion works:

I. Nature of works: (Reservoir, dam, ditch, flume, pumping plant, etc.)

II. Dimensions of works:

(a) Dam: Height.....feet; length at bottom.....feet; length at top.....feet; thickness at bottom.....feet; thickness at top.....feet; slope of front (water) face.....; slope of back face.....; material used in construction .....

(b) Reservoir; capacity when filled.....acre feet. Surface area at highwater mark.....acres.

Depth at Outlet—Feet	Surface Area at Each.....Feet of Depth at Outlet—Acres	Capacity—Acre-Feet
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

(c) Head gate: Width.....feet; height.....feet; Material .....

(d) Canal: Total length.....miles.

Location Below Headgate		Depth	Bottom Width	Width at Water Line	Grade Per Mile
At	mile	feet	feet	feet	feet
At	mile	feet	feet	feet	feet
At	mile	feet	feet	feet	feet
At	mile	feet	feet	feet	feet

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10. Time required for completion of work.....years.
11. Time required for complete application of water to the proposed beneficial use.....years.
12. Choice of newspaper for publication of notice of intention to appropriate .....

.....

STATE OF SOUTH DAKOTA }
County of..... } ss

I....., being first duly sworn on my oath depose and say: That my relation to the above described undertaking is that of....., that I
(Owner, manager or engineer)
have read the above and foregoing statement, and examined the map accompanying the same, and that I know of my own personal knowledge that the matters therein stated and shown are true.

Signed.....

Subscribed and sworn to before me this.....day of.....190.....

.....
Notary Public (or other qualified officer)

Remarks by State Engineer:

.....

STATE OF SOUTH DAKOTA }
County of..... } ss

Pierre, South Dakota, ...190....

This is to certify that the foregoing application was received at this office at.....o'clock.....m. upon the.....day of.....190.... and that after examination it was.....

.....

.....

.....
State Engineer.

By.....Deputy.

Number of permit.....
Date of first receipt of application.....190.....
Date of return to applicant for correction.....190.....
Date of receipt of corrected application.....190.....
Date from which applicant may claim right.....190.....
Approved.....190....., Recorded in Book.....Page.....

This is to certify that I have examined the foregoing application for a permit to appropriate water of the state of South Dakota, and I hereby grant the same as stated herein, subject, however, to the following limitations and conditions:

1st. The equivalent of at least one-fifth of the work above specified is to be completed on or before.....19.....

2d. The whole of said work is to be completed on or before..... 19.....

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3d. The limit of time for proof of beneficial use of water appropriated in accordance herewith is.....190.....

4th. The water appropriated shall be used for the purpose of.....

.....

5th. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.

6th. The amount of the appropriation herein granted shall not exceed.....cubic feet of water per second of time; neither shall it exceed the capacity of the above described system of diversion works, nor the least amount of water that experience may hereafter indicate as necessary for the production of crops in the exercise of the best husbandry; and further, said appropriation must be limited to not more than one-seventieth (1-70) of one cubic foot of water per second of time for each acre of land to which water is actually and beneficially applied for irrigation on or before.....19.....; said water to be used during the following described annual periods.

.....

.....

Witness my hand this.....day of.....190.....

.....

State Engineer.

By.....Deputy.

Form 3—Application for Permit to Appropriate Water, Enlargement

Form 3—Application for Permit to Appropriate Water—Enlargement.

No.....

Water Division No..... .....District.

[Blanks to be filled by the State Engineer]

APPLICATION FOR A PERMIT

To Appropriate Water Within the State of South Dakota

[Note—Draw lines through items not applicable. Where not otherwise stated all items refer to the proposed enlargement or extension.]

1. Name of applicant.....

Postoffice address....., County....., State.....

I. If a corporation: .....

(a) Name of same .....

(b) Date and place of incorporation.....

(c) Amount of capital stock.....

(d) Amount paid in.....

(e) Names and addresses of directors:

.....

.....

.....

[Note—A certified copy of articles of incorporation must accompany the application.]

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II. Method of accomplishing the work and financial resources of the applicant:

(a) Method of accomplishing the work. (Whether by contract, employment of others, or by personal labor).....

.....

(b) Cash on hand, $..... (c) Treasury stock, $.....

(d) Bonds to be issued, $....., (e) Other resources, $.....

2. Name of existing diversion works.....Permit No.....
Name of enlargement or extension.....

3. Quantity of water claimed by enlargement or extension.....cubic feet per second.

4. Source of water supply.....

5. Location of point of commencement of extension.....

6. Annual periods during which water is to be used.....

7. To be used for:

I. Irrigation or domestic use:

(a) Number of acres to be irrigated.....acres.

(b) Legal subdivisions to be irrigated.....

[Note—A list of lands to be irrigated, giving each subdivision and fraction with acreage thereof, should be written here, or may be appended as a part of this application. Same must also be shown on accompanying map.]

(c) Statement as to domestic use (giving location, etc.).....

II. Mining, power, manufacturing, transportation, or other purposes:

(a) Nature of use.....

(b) Amount of power to be generated.....horse power.

(c) Location of plant .....

(d) Method of developing power.....

(e) Point where water will be returned to stream.....

8. Estimated cost of works:

(a) Head gates, $..... (b) Pumping plant $.....

(c) Fluming, $..... (d) Canal-earth, $..... rock, $.....

(e) Other structures.....$..... Total, $.....

9. Description of diversion works:

I. Nature of works: (Reservoir, dam, ditch, flume, pumping plant, etc.).....

II. Dimensions of works:

(a) Dam: Height.....feet; length at bottom.....feet; length at top.....feet; thickness at bottom.....feet; thickness at top.....feet; slope of front (water) face .....; slope of back face.....; material used in construction .....

(b) Reservoir; capacity when filled.....acre feet. Surface area at highwater mark.....acres.

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Depth at Outlet—Feet	Surface Area at Each.....Feet of Depth at Outlet—Acres	Capacity—Acre-Feet

(c) Head gate: Width.....feet; height.....feet
Material .....

(d) Canal: Total length.....miles.

Location Below Headgate	Depth	Bottom Width	Width at Water Line	Grade Per Mile
At mile	feet	feet	feet	feet
At mile	feet	feet	feet	feet
At mile	feet	feet	feet	feet
At mile	feet	feet	feet	feet
At mile	feet	feet	feet	feet

(Give dimensions where reductions in size are made.)

10. Time required for completion of work.....years.
11. Time required for complete application of water to the proposed beneficial use.....years.
12. Choice of newspaper for publication of notice of intention to appropriate .....

STATE OF SOUTH DAKOTA
County of..... } ss

I, ..., being first duly sworn on my oath depose and say: That my relation to the above described undertaking is that of....., that I have
(Owner, manager or engineer)
read the above and foregoing statement, and examined the map accompanying the same, and that I know of my own personal knowledge that the matters therein stated and shown are true.

Signed.....

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Subscribed and sworn to before me this.....day of.....190....

.....

Notary Public (or other qualified officer).

Remarks by State Engineer:

.....

.....

STATE OF SOUTH DAKOTA
County of..... } ss

Pierre, South Dakota,.....190.....

This is to certify that the foregoing application was received at this office at.....o'clock.....m. upon the.....day of.....190....., and that after examination it was.....

.....

State Engineer.

By.....Deputy.

Number of permit.....
Date of first receipt of application.....190.....
Date of return to applicant for correction.....190.....
Date of receipt of corrected application.....190.....
Date from which application may claim right.....190.....
Approved.....190....., Recorded in Book.....Page.....

This is to certify that I have examined the foregoing application for a permit to appropriate water of the State of South Dakota, and I hereby grant the same as stated herein, subject, however, to the following limitations and conditions:

1st. The equivalent of at least one-fifth of the work above specified is to be completed on or before.....19.....

2d. The whole of said work is to be completed on or before..... 19.....

3d. The limit of time for proof of beneficial use of water appropriated in accordance herewith is.....19.....

4th. The water appropriated shall be used for the purpose of.....

.....

5th. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.

6th. The amount of the appropriation herein granted shall not exceed.....cubic feet of water per second of time; neither shall it exceed the capacity of the above described system of diversion works, nor the least amount of water that experience may hereafter indicate as necessary for the production of crops in the exercise of the best husbandry; and further, said appropriation must be limited to not more than one-seventieth (1-70) of one cubic foot of water per second of time for each acre of land to which water is actually and beneficially ap-

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plied on or before.....19.....; said water to be used during the following described annual periods:

.....

Witness my hand this.....day of.....190.....

.....

State Engineer.

By.....Deputy.

Form 6—Acknowledgment of Receipt of Application

Form 6—Acknowledgment of Receipt of Application. No.....

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

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.....

Your application dated.....190.....for a permit to appropriate water from.....through the .....together with a fee of $5.00 for the examination of same, the receipt of which is hereby acknowledged, was received this day and has been duly filed under the temporary number ..... The application will be examined in regular order as soon as possible, after which you will be notified as to further action on your part.

Very respectfully,

.....

State Engineer.

By.....

Deputy.

Form 7—Notification of Corrections to Be Made

Form 7—Notification of Corrections to be Made. No.....

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

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.....

Your application No..... for a permit to appropriate.....

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cubic feet of water per second from.....
near.....in.....County, South Dakota, has been received and examined and is returned to you herewith for correction in the following particulars:

.....

.....

In accordance with Section 20 of the Irrigation Code of South Dakota you will now have sixty days from date of this letter to complete your application and to refile same in this office.

Very respectfully,

.....
State Engineer.

By.....
Deputy.

Form 8—Publication of Notice

Form 8—Publication of Notice. No.....

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

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.....

You are hereby notified that your.....application No.....for a permit to appropriate water from.....
.....through the.....
has been examined and found to comply with the irrigation law of South Dakota and the regulations thereunder. You are now instructed to publish a notice of your intentions in relation to this proposed appropriation once a week for four consecutive weeks in some paper of general circulation in the stream system in which the works are to be located, in accordance with Section 21 of the Irrigation Code.

A notice is enclosed herewith which you are directed to publish in the.....printed at.....South Dakota, in compliance with the law, you making the necessary arrangements with the publisher as indicated in the letter to him, also enclosed.

The proof of publication, also sent herewith, must be filed in this office on or before.....190....., this date being sixty days from the date of these instructions. In case of failure to file satisfactory proof within the time stated, your application will thereafter be treated as an original application filed on the date of the receipts of

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proof of publication in proper form. It is to your interest, therefore, to see that the proof is promptly returned to this office as directed.

Very respectfully,

.....

State Engineer.

By.....

Deputy.

Form 9—Notice of Intention to Appropriate Water

Form 9—Notice of Intention to Appropriate Water. No.....

(First Publication.....190.....)

APPROPRIATION OF WATER

Office of the State Engineer

Pierre, S. D., ...190.....

Notice is hereby given that.....whose postoffice address is....., ...county, S. D., has made an application in accordance with the provisions of the irrigation laws of South Dakota for a permit to appropriate for beneficial use .....cubic feet of water per second of time from..... through the....., the point of diversion of which is to be located upon the.....bank of said stream in the..... ¼ of the.....¼ of section....., township....., range..... said water to be used for the purpose of..... upon the .....

.....

This application will be taken up by the state engineer at his office at Pierre for consideration and appropriate action upon the..... day of.....190....., at 9 a. m., at which time all persons who believe that the prior rights would be injuriously affected, or that the allowance of the permit would be detrimental to the public welfare, and also parties making the application, and to be benefitted, are notified to be present either by sworn affidavit or in person for the purpose of presenting any relative testimony.

.....

State Engineer.

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Form 10—Letter to Publisher

Form 10—Letter to Publisher—Notice of Intention to Appropriate.

No.....

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

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.....

Enclosed find form of notice of the application of..... for a permit to divert water from.....in..... county, South Dakota, which please publish once a week for four consecutive weeks in your paper, the....., as provided for in Section 21, of Chapter 132, of the Session Laws of 1905 of South Dakota.

The expense of the publication will be paid by..... with whom you will make the necessary arrangements, and to whom you will kindly furnish proof of publication of this notice on or before .....190.....

Please receipt for this notice on the form below as promptly as possible, kindly mailing me also a copy of the first issue containing this publication that I may compare it with my records.

Very respectfully,

.....

State Engineer.

By.....

Deputy.

....., S. D., ...190.....

State Engineer, Pierre, S. D.

Dear Sir: I am in receipt of your letter of.....190....., enclosing notice of application No..... for the use of water, which will be published as requested, commencing with our issue of..... 190.....

Very truly yours,

.....

Form 11—Letter Accompanying Proof of Publication

Form 11—Letter Accompanying Proof of Publication of Intention to Appropriate Water

No.....

..... S. D., ...190.....

State Engineer, Pierre, S. D.

Dear Sir: Enclosed please find for filing the proof of publication of

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notice of my intention to appropriate for beneficial use waters of the state of South Dakota as shown in the notice. A filing fee of $1 is also enclosed.

Very truly yours,

.....

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

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.....

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.....

Receipt is hereby acknowledged of your letter of..... 190.....enclosing proof of publication of notice of your intention to appropriate water in accordance with the terms of your application No..... together with a fee of $1 for filing same.

Very respectfully,

.....

State Engineer.

By.....

Deputy.

Form 12—Proof of Publication—Appropriation of Water

Form 12—Proof of Publication—Appropriation of Water No.....

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA }
County of..... } ss

.....being duly sworn, deposes and says the annexed printed copy of Notice Intention to Appropriate Water was taken from the.....a newspaper which during the whole time of publication of said notice hereinafter stated, has been and is printed and published in the.....of..... county of.....and state of South Dakota. That the said notice was published in said newspaper on the following dates:

.....

.....

in each and every issue of the full number thereof, the first publication being made on the.....day of.....190.....and the last publication on the.....day of.....190....., upon which days or times of publication aforesaid the newspaper was regularly published, and that during the whole time of said publication he was..... the printer.....and publisher.....of said newspaper.

.....

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Subscribed and sworn to before me this.....day of.....
A. D. 19.....

.....

Notary Public.....County, S. D.

Form 13—Notification of Recording Fees, Etc.

Form 13—Notification of Recording Fees upon Approval of Application

STATE OF SOUTH DAKOTA No.....
Office of
STATE ENGINEER
Pierre

.....190.....

.....

.....

.....

.....

You are hereby notified that your application No.....for a permit to appropriate water from.....through the..... has been duly examined, that notice of your intention has been duly published, and that a hearing concerning the same was held in this office upon.....190.....and that it has now been approved and is being held for record subject to the payment of $.....as fees for recording the same. Upon receipt of this amount, which should be within thirty days from the date thereof, the application with permit will be recorded as soon as possible, in regular order, and the permit forwarded to you. In case the fees are not received within the thirty days prescribed, you will forfeit your priority of application as stated in the instructions previously sent you. Very respectfully,

.....
State Engineer.

By.....
Deputy.

Form 14—Rejection of Application for Permit

Form 14—Rejection of Application for Permit No.....

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

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.....

You are hereby notified that your application No.....for a per-

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mit to appropriate water from.....through the .....has been duly examined, that notice of your intention has been duly published and that a hearing concerning same was held in this office upon.....190....., and that it has been found necessary to reject the application for the following reasons:

.....

.....

You are further informed, however, that you are entitled to appeal to the circuit court, should you so desire, within sixty days of the date of this notification. (See Sec. 23, Irrigation Code of 1905.)

Very respectfully,

.....

State Engineer.

By.....

Deputy.

Form 15—Transmittal of Fees, Recording Application for Permit

Form 15—Transmittal of Fees for Recording Application for Permit

No.....

.....S. D., ...190.....

State Engineer, Pierre, S. D.

Dear Sir: In accordance with the directions contained in your letter of.....190....., I am forwarding herewith $..... as fees for recording my application No.....for a permit to appropriate.....cubic feet of water per second from.....

Very truly yours,

.....

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

.....

.....

.....

.....

Receipt is hereby acknowledged of your letter of..... together with $.....as fees for recording your application for a permit No.....

Very respectfully,

.....

State Engineer.

By.....

Deputy.

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Form 16—Issuance of Permit to Appropriate Water

Form 16—Forwarding Application. No.....

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

.....,.....

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Enclosed herewith please find your application No.....for a permit to appropriate.....cubic feet of water per second through the .....to which I have given my approval, thus authorizing you to make the appropriation requested under the conditions therein stated.

Very respectfully,

.....
State Engineer.

By.....
Deputy.

Each application is accompanied by two maps, an original and a duplicate, made in accordance with the prescribed rules. When the application is approved the duplicate map is likewise approved and returned with the permit to the applicant. The original map is filed permanently in the State Engineer's office under the number of the permit. The maps which accompany applications form an important portion of the records of this department. For this reason the rigid requirements of the State Engineer, calling for a certificate from the engineer or surveyor who did the work, are intended for the best interests of all concerned.

Maps. The following instructions relating to maps are taken from page 6 of the circular issued by this office: "All maps submitted shall be in duplicate. The original must be on tracing linen, and the other may be either a blue print copy or drawn upon thin drawing paper or tracing paper. The size of each sheet shall be 24 x 36 inches, with a two-inch margin on the left hand side, making the available space 24 x 34 inches. All maps to be made of this size, irrespective of the size of the ditch or reservoir to be shown. The scale of the map must correspondingly vary, but should be sufficient to show clearly each course and distance. It is desirable in the case of reservoirs that the scale should be four hundred feet to an inch or larger when needed, to properly show the proposed works. In case one sheet is not sufficient for this purpose,

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two or more may be used. In such case each sheet should be marked "Sheet No. 1," "Sheet No. 2," etc., and each sheet properly titled.

Further details concerning maps to accompany applications are given in the circular above referred to.

Dry Draw Filings

Under the provisions of Section 31, Chapter 180 of the Session Laws of 1907, appropriations of flood water can be made on dry draws without the necessity of obtaining a permit from the State Engineer. A dry draw is therein defined to be any ravine or water course not having a flow of at least twenty miner's inches of water flowing during the greater part of the year.

A great many filings have been made under the provisions of this section, and many inquiries have been directed to this office for information concerning the proper form of notice to use in making such locations. Although it is expressly stated that those holding rights under this section are not under the jurisdiction of the State Engineer, the demand for such information has been so great that a form of location notice has been prepared for this purpose. This form is as follows:

Location Notice

Know All Men by these Presents:

That..... whose postoffice is....., South Dakota, a citizen of the United States, above the age of 21 years, being in possession of the following described land, to-wit:..... section.....township.....range.....B. H. M. in .....county, South Dakota. Said land comprising Desert Entry No..... .....Land District, availing .....self of the right granted.....under the provisions of Section 31 of Chapter 180 of the Session Laws of South Dakota of 1907, has located and claims the right to construct a certain dam across a dry draw situated in the..... 1-4 of the.....1-4 section.....township..... range.....B. H. M. and has located and claims the right to construct ditches and flumes for the purpose of directing flood waters from said dam for irrigation of the land first above described, and claims the right of way across any land for the purpose of conveying water for said purpose.

Said locator claims for the above purpose.....cubic feet of water per second during the following described annual periods..... .....inclusive, each year.

The location of the point of diversion of the reservoir is as follows: From the .....

The ditch.....will run in a.....direction to and on said land for a distance of.....feet.

Said location was made on the.....day of.....191.....

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Witness my hand and seal this.....day of.....191.....

.....

Locator.

STATE OF SOUTH DAKOTA }
County of..... } ss

On the.....day of.....191....., before me....., a Notary Public in and for the County and State aforesaid, personally appeared.....to me personally known to be the person who executed the foregoing instrument and acknowledged that he executed the same for the uses and purposes therein set forth.

Witness my hand and official seal the day and date above written.

.....

Notary Public.

Pierre, South Dakota.....191.....

This is to certify that the foregoing location notice was received at this office at.....o'clock.....M., upon the.....day of..... 191....., and after examination it was.....

.....

State Engineer.

Completion of Diversion Works. On the date set for the completion of works for which a permit has been issued, or prior thereto, upon notice from the owner that the work has been completed, the State Engineer will cause the works to be inspected. When the works are found in a satisfactory condition, after inspection, the State Engineer will issue a certificate of completion. A similar inspection is required at the time set for the application of the water to a beneficial use. If requested by the owner, the State Engineer may make or cause to be made the inspection to determine the amount of water applied to a beneficial use at the same time as that of the constructed work. Upon the completion of such inspection, the State Engineer will issue a license to appropriate water to the extent and under the conditions of the actual application thereof to beneficial use, but in no manner extending the rights described in the permit.

The following forms are used in connection with the completion of diversion works and the application of the water to beneficial use:

Form 17—Notice of Completion of Works

Form 17 Permit No.....

Water Division No..... .....Water District

NOTICE OF COMPLETION OF WORKS

(This blank must be filled out by the holder of permit and forwarded to the State Engineer at least 60 days before the time set for completion of works)

(P. O.).....

(Date).....

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To the State Engineer of South Dakota, Pierre:

Dear Sir: Notice is hereby given of the completion of the works for the diversion of.....second feet of the waters of the state from.....through the.....for..... purposes.....in accordance with the terms and conditions of a certain permit heretofore issued by the State Engineer of the state of South Dakota.

1. The name of the person or corporation holding said permit is .....

2. The postoffice address of such person or the place of business of such corporation is.....county of.....state of.....

3. The number of such permit is.....and the date set for the completion of such work is.....

4. Said water to be used for.....purposes.

5. Said works of diversion will be fully completed on the date set for such completion, and the amount of water which said works are capable of conducting to the place of intended use, in accordance with the plans accompanying the application for such permit is..... cubic feet per second.

6. The amount of land for which said water is available is..... acres, particularly described as follows: .....

.....

(In case of all canals or other works designed to divert and carry more than 50 cubic feet of water per second, the following certificate must be signed by a well known and competent engineer.)

I hereby certify that the facts set forth in the above notice are true.

.....

Engineer.

(Signature).....

.....

.....

.....

Form 18—Notice of Application of Water to Beneficial Use

Form 18

Permit No.....

Water Division No..... .....Water District

NOTICE OF APPLICATION OF WATER TO BENEFICIAL USE

(This blank must be filled out by holder of permit and forwarded to the State Engineer at least 60 days before the time set for application of water.)

(P. O.).....

(Date).....

To the State Engineer of South Dakota, Pierre:

Dear Sir: Notice is hereby given that on the.....day of..... 19....., at.....county of.....state of South Dakota, before

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.....proof will be submitted of the appli-
(Examining Engineer or Officer)
cation to beneficial use of.....cubic feet per second of the waters of.....in accordance with the terms and conditions of permit No.....heretofore issued by the State Engineer of South Dakota.

1. The name and postoffice address of the person or corporation holding said permit are.....
.....

2. The use to which said water has been applied is.....
.....

3. The amount applied to beneficial use is.....

4. The place where said water is used is (if for irrigation, give full and accurate description of the lands irrigated).....

5. The name of the canal or ditch or other works by which said water is conducted to such place of use is.....

6. The right to take the water from such works is based upon permit No.....

7. The source of supply from which such water is diverted is.....

8. The date of priority which said user is prepared to establish is
.....

(Signed).....

For 19—Authorization to Make Inspection

Form 19—Authorization to Make Inspection.

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....
.....

.....

.....

Dear Sir:

....., of .....county, South Dakota, holder of permit No....., which permit authorizes the diversion of.....second feet of water from..... at....., ha.... informed this office that the diversion works will be fully completed on....., 19....., and will be ready for examination on or after that date.

Application of water to beneficial use will be made..... 190....., and the appropriator will be prepared for an inspection of same on....., 19.....

Will you therefore please arrange with the holder of said permit for an examination of the works on....., 19....., and also for

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making an inspection to determine the amount of water applied to beneficial use on....., 19.....

In this examination you will ascertain whether or not the constructed works comply fully with the terms of the permit, and give in complete form all the information which is suggested by the statements in the Certificate of Inspection which is herewith enclosed, and such other information as will enable the State Engineer to act intelligently and judicially in issuing his certificate of completion.

In furnishing evidence of the proof of application of water to beneficial use, you should endeavor to obtain, in addition to your personal knowledge, full and complete information from reliable witnesses concerning the actual use of the water on the land for irrigation, or its utilization for other beneficial purposes.

You should also arrange with the holder of the permit for the payment of your fee for this service and such proper expenses as you may incur in making this examination and report and taking the testimony.

Please advise me promptly of your receipt of this communication, and whether or not you will be able to act in the capacity as requested.

Yours very truly,

.....

State Engineer.

Form 20—Notification of Inspection of Works

Form 20—Notification of Inspection of Works.

STATE OF SOUTH DAKOTA
Office of
STATE ENGINEER
Pierre

.....190.....

.....

.....

.....

Dear Sir:

Receipt is hereby acknowledged of your letter of..... enclosing notice of completion of works.

Mr.....of..... has been authorized to make the inspection of the diversion of works constructed under authority of permit No....., on.....190..... In case you so desire the inspection to determine the amount of water applied to beneficial use will be made at the same time as that of the constructed work, by the same examining officer.

If, for any sufficient reason, it would be inconvenient or impossible for either yourself or the examining officer to be present at the place and date above specified, a more convenient date may be mutually agreed upon, provided that this office be notified of such action at least

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two weeks before the date thus set, and, provided, that the dates designated are not later than the dates named in the application for the completion of the works and the application of the water to beneficial use.

Yours very truly,

.....

State Engineer.

Form 21—Certificate of Construction of Works

Form 21.

Permit No.....

Water Division No..... .....Water District

CERTIFICATE OF CONSTRUCTION OF WORKS

To All Whom It May Concern:

This is to certify, that..... of....., county of....., and state of....., the holder....of permit No....., issued upon application No....., bearing date of priority of....., authorizing the diversion of..... second-feet of the waters of....., county of....., state of South Dakota, at....., for..... purposes, ha.... fully complied with the provisions of the laws of the state of South Dakota relating to proof of completion of the works of diversion set out and described in said permit; that said works are adequate for diverting and conveying to the place of intended use..... second-feet of water; and that the lands proposed to be irrigated by the use of said water are described as follows, to-wit: .....

.....

.....

Witness my hand this.....day of.....A. D. 19.....

.....

State Engineer of South Dakota.

Form 23—Certificate of Examination of Works

Form 23.

Permit No.....

Water Division No..... .....Water District

CERTIFICATE OF EXAMINATION OF WORKS

Report of Examining Engineer

To the State Engineer, Pierre, South Dakota:

Dear Sir: I hereby certify that in accordance with your letter of authorization dated....., 19....., I have this day made a thorough examination of the diversion works constructed by....., of.....county, South Dakota, holder.... of permit No....., issued upon application No....., bearing date of priority of....., 19....., authorizing the diversion of.....second-feet of the waters of .....for.....purposes. I have to report on the condition of the same as follows:

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The diversion works comprise: .....
.....
and the system is in the following condition: .....
.....
The point of diversion is located.....
.....
The works are capable of diverting and conveying to the place of use.....second-feet of water, which is to be used for.....
.....
The legal subdivisions to be irrigated are: .....
.....
comprising a total of.....acres of land. The domestic use intended comprises .....
The utilization for power, mining, or other beneficial uses comprises:
.....
Witness my hand, this.....day of.....A. D. 19.....
.....
Examining Engineer.

Form 24—Certificate of Application of Water to Beneficial Use

Form 24.

Permit No.....

Water Division No..... .....Water District

CERTIFICATE OF APPLICATION OF WATER TO BENEFICIAL USE

Deposition of Holder

Ques. 1. State your name, residence, occupation and postoffice address.

Ans.....

Ques. 2. If acting in behalf of a corporation, state its name, principal place of business (if a foreign corporation, give name and postoffice of statutory agent), your position with reference to same, and your authority for appearing in its behalf.

Ans.....

Ques. 3. State number and date of permit, and date of priority you propose to establish under the permit.

Ans.....

Ques. 4. State source of water supply and give exact location of point of diversion.

Ans.....

Ques. 5. Describe your works of diversion, and state amount of water they are capable of conveying from point of diversion to place of use, and give name of canal or ditch or other works by which water is conducted to such place of use.

Ans.....

Ques. 6. State for what purpose water is used and describe place of use. (If for irrigation, name each subdivision in which used, and num-

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ber of acres in each subdivision that have ACTUALLY been irrigated with said water.)

Ans.....

Ques. 7. If for other than irrigation purpose, state how applied, amount of horse power generated, etc.

Ans.....

Ques. 8. What is the minimum amount of water required for the use specified above?

Ans.....

Ques. 9. If you are not the person or representative of the corporation to whom above mentioned permit was originally issued, please state how ownership was acquired by present holder.

Ans.....

Ques. 10. State when, how, in what amount and to what extent the water diverted under above mentioned permit has been used.

Ans.....

(Sgn).....

I hereby certify that the foregoing testimony was read to the above subscriber before its signing, that I believe him to be the person he represents himself to be, and that said testimony was subscribed and sworn to before me, at my office in....., county of....., state of South Dakota, on this.....day of.....A. D. 19.....

.....

.....

Form 25.—Application for Extension of Time for Completing Works

Form No. 25.

APPLICATION FOR EXTENSION OF TIME FOR COMPLETING WORKS

To the State Engineer, Pierre, South Dakota.

Dear Sir: I hereby request that an extension of time be granted me for the completion of works to be done under permit No.....

Said works are located in.....county and are described as follows:

Location of headworks: In the .....¼ of the .....¼ of section....., township....., range.....E. B. H. M.

The water is to be used for the purpose of.....

The present condition of said works is as follows: .....

The extension of time for the completion of these works is requested for the following reasons: .....

.....

Holder of permit No.....

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Water License

State of South Dakota

WATER LICENSE NO.....

Whereas, on the.....day of.....A. D. 19.....
.....
of.....county of.....and state of.....
duly made application (No.....) to me for a permit to use.....
cubic feet per second of the waters of.....county of.....
state of South Dakota, for.....purposes; and

Whereas, on the.....day of.....A. D. 19.....
permit No.....was issued to said applicant.... for the diversion of said water, and providing for the completion of the works of diversion therein described on or before the.....day of.....A. D. 19.....,
and for the application to beneficial use of said water on or before the .....day of.....A. D. 19....., and

Whereas, on the.....day of.....A. D. 19.....,
the holder.... of said permit duly made proof of the completion of adequate works for the diversion of.....cubic feet per second of said waters, as evidenced by my certificate No....., dated.....,
confirming the completion of works of sufficient capacity for diverting and conveying to the place of intended use.....cubic feet per second of water, with date of priority of.....and,

Whereas, on the.....day of.....A. D. 19.....,
proof was duly made of the application to beneficial use of.....
cubic feet per second of said water:

.....
.....
.....

Now, therefore, by virtue of the authority vested in me by the laws of the state of South Dakota, I hereby grant and confirm to.....
.....of.....the holder.... and owner.... of said permit No....., a water right, dating from....., to the use of.....cubic feet per second of the waters of.....,
in the county of....., and state of South Dakota, or so much thereof as may be necessary for the purposes hereinbelow mentioned,
to be diverted at.....
and conducted to and upon.....
for the purpose.... of.....
subject, however, to the laws of the state of South Dakota applicable to a license for the use of the waters of the state, and subject, also, to the local or community customs, rules and regulations which have been or may be adopted from time to time by a majority of the users from a common source of supply, canal or lateral from which such water may

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be taken, when such rules and regulations have for their object the economical use of such water.

Witness, My hand and the seal of my office at Pierre, South Dakota, this..... day of.....A. D. Nineteen Hundred and.....

..... State Engineer.

Desert Land Filings

Many of the dry draw filings received in this office were made on desert land claims, and in such cases the applicants are required to furnish the general land office evidence showing an absolute right to sufficient water to irrigate the land. In compliance with this requirement a certificate is required from the State Engineer to the effect that the applicant is entitled to a water right under the laws of the state. Before such a certificate can be issued it is necessary for the State Engineer to have evidence showing that the diversion works have been completed and the water applied to beneficial use. This will require the inspection of the works by a competent engineer and a report from him, also proof of the application of the water to beneficial use. When the necessary evidence has been received the State Engineer issues a certificate in the following form:

Certificate

STATE OF SOUTH DAKOTA
Office of State Engineer
PIERRE

STATE OF SOUTH DAKOTA } ss
County of Hughes..... }

This certifies that....., whose postoffice address is....., ...county, South Dakota, has filed in this office a location notice of a certain dam for impounding flood waters, in accordance with the provisions of Section 31 of Chapter 180, of the Session Laws of 1907, of the state of South Dakota, relating to the filing of water rights upon dry draws or water courses. Said dam is located in the .....¼ of the .....¼, of section....., township....., range.....E. B. H. M.

The lands to be irrigated comprise.....acres in the....., as shown by the map accompanying said location notice; said lands comprising desert entry No.....

The said.....has furnished this office proof of completion of.....irrigation system and of the application of the water to beneficial use and.....is hereby authorized to use sufficient water to irrigate the lands herein designated.

Witness my hand and official seal, this.....day of....., 1910.

(Seal) .....
State Engineer.

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Office Equipment

The furniture and equipment of this office has been purchased from time to time, as needed and as funds allotted for such purpose have been available.

The rooms now occupied by the State Engineer in the new capitol building are much more commodious and convenient than those formerly used for this purpose in the old state house.

The office furniture now on hand comprises a good equipment of desks, drawing tables, letter and document files, map cases, etc.; also a set of steel vault furniture for filing and storing records and official papers. Most of this furniture is new and of the best quality.

Instruments

Since there will necessarily be considerable field work done under the direction of this office, especially in the way of reconnoissance and hydrographic surveys, an outfit of instruments has been purchased. This outfit comprises two transits, one level, two wooden range poles, two stadia rods, one level rod, two 100-foot steel tapes, one 50-foot metallic tape, one 25-foot steel tape, one aneroid barometer, and one pair of field glasses. In addition, a first class photograph camera, size 5 x 7, fitted with a very fine Bausch and Lomb lens, has been purchased. Photography has come to be recognized as an essential adjunct to engineering operations, and the State Engineer's office, above all others, should be provided with facilities for illustrating its work.

A few drawing instruments have been purchased, which are sufficient for the present needs of the office. These will be added to as the drafting work of this department increases in volume.

A part of the necessary equipment of this office is a current meter for use in stream measurements. Such an instrument has not yet been purchased, however, for the reason that the work of gaging the streams in this state has not been taken up by this department. It is expected that this work will be taken up later and carried on in conjunction with the U. S. Geological Survey.

Practical Working of Water Law

A period of five years has elapsed since the enactment of the Water Code in South Dakota and the inauguration of the present state water administration. The first State Engineer began active duties April 1, 1906, and proceeded at once to formulate the necessary rules and regulations for the work of his department and, in other ways, to carry out the requirements of the law.

The state was divided into three grand divisions, known as water divisions; two of these divisions lie west of the Missouri river, the portion of the state east of the Missouri forming the third water division. Each water division is subdivided into water districts; these are designated by names and comprise one or more distinct stream systems in each district.

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An assistant State Engineer was appointed and was assigned the duty of conducting hydrographic surveys of the various stream systems. This work is carried on continuously; field work is done during the spring, summer and fall months, and in winter the field notes are platted on sheets of uniform size for permanent record. Several of the more important streams that are used for irrigation have been surveyed and carefully platted.

The revised Water Code requires regulation and supervision by the State Engineer over water appropriations for power purposes, and other beneficial uses, as well as for irrigation. Many permits have been obtained for water power appropriations under this law in the Black Hills. In most cases the power plants are located on the upper reaches of the streams and in such cases the water, after being utilized for power, is returned to the channel for further use lower down stream. In some instances the same water is used more than once in its flow, for generating power in a stream. Further down the valley, where the agricultural lands lie, the water is used for irrigation.

In the eastern part of South Dakota, where irrigation is not practiced, the appropriations of water have been made for power purposes. At Sioux Falls a large development has been made on the Big Sioux river. A plant capable of generating 3,000 horse power has been constructed and is now in successful operation.

The experience of the first five years of the South Dakota water administration is, on the whole, quite satisfactory. At first considerable opposition was manifested toward the fancied restrictions imposed; this was largely by people who sought to uphold the doctrine or riparian rights exclusively. Since, however, the necessity of some central regulation of water rights in this state has become apparent, this opposition has greatly diminished. The fairness with which the water law has been administered and the protection against unjust claims which has been afforded water users have served to convince the public of the usefulness of this law.

A practical illustration of its application is afforded in the large power development at Sioux Falls, above referred to. The company having this matter in charge made an effort to place their securities with leading financiers for the purpose of raising funds for construction purposes, and the advice of an eminent attorney was asked concerning the safety of the proposition. His reply was to the effect that, since the company had obtained a state water right, they were protected by the state against possible adverse claimants. He went further and said that he would not have recommended the handling of the securities but for the state water right that had been obtained.

It is believed that the water law, in its essential features, has come to stay in South Dakota. There will probably be minor changes from time to time to conform to local conditions, but the principles established by the law will be maintained.

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APPROPRIATION OF WATER

Old Water Rights

Prior to the enactment of the Water Code a great many water rights or claims were filed by users and intending users of water on streams in the western part of the state. Under the laws and customs then in force these claims were filed with county officers and thus made a matter of local record. The law requires that a transcript of all water records must be forwarded to the State Engineer from each county involved. This has been done and this office is now in possession of certified copies of the water rights filed under the old law. Many of these claims were speculative, and on some streams single filings claimed more water than the stream contains. Some of the filings were never used, some were abandoned, and some have been forfeited from non-use. In some cases, however, the water rights have been kept alive and are now valid rights. It is necessary for this office to ascertain what proportion of the water in the various streams has been previously appropriated and what is still available for beneficial use. This information is necessary in many cases to show if a proposed ditch or diversion works would conflict with existing rights. The hydrographic surveys of Rapid creek and other streams in the Black Hills have disclosed much valuable information of this nature; and considerable information concerning the condition and status of water rights on other streams has been obtained by reports of water commissioners. It is expected that authentic data relating to all water rights in the state, both new and old, will in due time be on file in this office.

New Water Rights

A great many permits to appropriate water under the present Water Code have been issued from this office. These permits are all duly recorded in a suitable book provided for the purpose and are thus made a matter of permanent record in the state capitol. As the country becomes more thickly settled and land becomes more valuable, these water rights will increase greatly in value. The following list comprises permits that have been granted since the establishment of this office:

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PERMITS

— TO —

APPROPRIATE WATER

ISSUED SINCE THE ENACTMENT OF
THE WATER CODE

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PERMITS TO APPROPRIATE WATER
Issued Since the Enactment of the Water Code

No. of Permit	No. of Division	NAME OF APPLICANT	Name of Stream	Estimated Cost	Purpose	Acres Irrigated	Date of Completion
1	2	Edwin S. Johnson	Rapid Creek	$ 5,000	Water power		Sept. 28, 1910
3	1	John O'Connor	Gander Run	1,280	Irrigation	160	Sept. 8, 1906
2	1	Louis Barber	Basin Creek	1,500	Irrigation	149.6	Sept. 27, 1906
3	1	Wm. M. Fieldsend	Fieldsend Creek	2,250	Irrigation	85.14	Sept. 1, 1906
4	1	Agnes A. Fieldsend	Hazel and Fieldsend Creeks	1,500	Irrigation	150.39	Jan. 1, 1906
3	2	Isabel S. Humphrey	Bad Land Draw	1,114	Irrigation	100	Oct. 15, 1907
4	2	Isabel S. Humphrey	Hawk Nest Gulch	658	Irrigation	110	Oct. 15, 1907
2	2	Mattie S. Burke and Isaac M. Murphy	Box Elder Creek	1,380	Irrigation	400	July 1, 1907
5	1	I. H. and Frances S. Chase	Little Alkali Creek	858	Irrigation	455	Oct. 5, 1907
5	2	August Mallow	Hay Draw	890	Irrigation	334	Oct. 18, 1907
7	1	Black Hills Traction Co.	Redwater River and Crow Creek	216,650	Electric power		June 22, 1907
6	2	Patton Live Stock Company	Elk Creek and Heron Draw	6,420	Irrigation	1,603	Jan. 3, 1907
6	1	George Couch	Sour Dough Flat Creek	672	Irrigation	106.56	Nov. 6, 1908
6a	1	George Couch	Sour Dough Flat Creek	517	Irrigation	12	Nov. 6, 1908
8	1	Black Hills Traction Co.	Spearfish Creek	183,000	Electric power		Aug. 30, 1909
7	2	John H. Soske	North Duck Creek	500	Irrigation	44	Mar. 4, 1907
9	1	Tylta Sundquist	No name	575	Irrigation	39.25	Aug. 21, 1908
16	2	Sam Franzen	Little Plains Creek	1,000	Irrigation	349.50	June 19, 1907
10	2	Iowa Irrigation Ditch Co.	Rapid Creek	7,680	Power	1,028	Sept. 27, 1909
13	2	Woodford J. Smith	South Draw	325	Irrigation	158.90	April 2, 1907
12	2	Gustave C. Katsch	Ayres Draw	1,500	Irrigation	133.50	Mar. 27, 1908
14	2	Chas. B. Smith	Five Miles Draw	960	Irrigation	148.66	April 2, 1908
15	2	Mrs. Maggie Smith	Cairn Draw	862	Irrigation	249.04	April 2, 1907
10	1	Louise M. Cates	No name	475	Irrigation	22	Oct. 17, 1908
7	2	G. W. Wattles	Springer's Springs	23,000	Water power	60	Oct. 1, 1907
8	2	Hot Springs Irrigation & Live Stock Company	Cascade Creek	19,500	Irrigation	2,600	June 22, 1907
12	1	Martha G. Simmons	Plum and Wildcat Creeks	1,180	Irrigation	161	Nov. 21, 1907
13	1	Samuel C. Simmons	Plum and Wildcat Creeks	1,180	Irrigation	211	Nov. 25, 1907

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11	1	Roy S. Scott	Shaw Creek	3,610	Irrigation	480	Nov. 30, 1908
14	1	Clyde C. Gilbert	Valley Creek	450	Irrigation	145	Mar. 19, 1908
19	2	John Hart	Spring Creek	1,870	Irrigation	650.8	Dec. 21, 1909
15	1	Dena S. Ackerman	Four-Mile Creek	1,017	Irrigation	234.88	June 28, 1907
20	2	J. C. Snidow	French Creek	1,910	Irrigation	186.2	July 5, 1909
21	2	J. C. Snidow	French Creek	740	Irrigation	142	July 5, 1909
22	2	Mrs. J. K. Dow	No name	400	Irrigation	81.50	July 5, 1909
16	1	Henry G. Stolzenberg	North Fork Creek	335	Irrigation	120	Jan. 27, 1909
23	2	Cheyenne Valley Ranch Co.	Cascade Creek	500	Irrigation	50	Aug. 3, 1908
24	2	Cheyenne Valley Ranch Co.	Cascade Creek	13,750	Irrigation	877.7	Aug. 6, 1907
25	2	L. D. Taylor	Box Elder Creek	650	Irrigation	780.3	Feb. 20, 1910
17	1	Bertha G. Davis	Sage Creek	1,070	Irrigation	68	Feb. 26, 1908
27	2	Chicago, Burlington & Quincy Railway	Long Branch Creek	2,500	Supply engines	.5	Mar. 27, 1908
1	3	Sioux Falls Light and Power Company	Big Sioux River	200,000	Electric power		Mar. 27, 1910
2	3	Sioux Falls Light and Power Company	Big Sioux River	7,000	Power		Sept. 27, 1907
3	3	E. W. Coughran	Big Sioux River	8,100	Power		Mar. 27, 1910
28	2	Laura J. Mudge	No name	500	Irrigation	320	Apr. 7, 1910
26	2	Water, Light & Power Co.	Fall River	16,000	Power		Apr. 2, 1908
20	1	Mrs. A. H. Bolt	Hatch Creek	100	Irrigation	30	Apr. 16, 1908
21	1	Loranger and Jarvis	Hatch Creek	100	Irrigation	5	Apr. 16, 1908
23	1	Sarah F. Cox	Crooked Creek	825	Irrigation	172.32	Oct. 23, 1908
22	1	Ewell Hanks	Morse Creek	200	Irrigation	40	Apr. 28, 1908
7	3	Sioux Falls Electric Light and Power Co.	Lake Poinsett		Storage		May 20, 1910
8	3	Sioux Falls Electric Light and Power Co.	Big Sioux River	10,090	Power		May 20, 1910
32	2	Ira U. Pickett	No name	2,400	Irrigation	640	May 29, 1910
34	2	Andrews and Eckard	No name	2,000	Irrigation	480	Dec. 10, 1908
42	2	Teddy Bear Gold Mining Co.	Castle Creek	20,600	Power		Sept. 25, 1910
33	2	Maggie Madsen	Skull Creek	1,450	Irrigation	520	June 12, 1910
18	1	Patrick J. O'Connor	Slate Creek	1,765	Irrigation	351.35	June 13, 1908
19	1	Patrick J. O'Connor	Badger Creek	760	Irrigation	142.20	June 13, 1908
39	2	Gordelia Mining Co.	No name	2,500	Power		Jan. 16, 1908
37	2	Ernest C. Engel	Pine Creek	35,000	Power		July 16, 1908
38	2	William G. Phillips	Box Elder Creek	365	Irrigation	130	Feb. 21, 1910
31	2	Heppner Company	Plum Creek	4,100	Irrigation	960	Aug. 21, 1910
40	2	Jacob Kircher and Andrew Hibbeln	Camp Creek	580	Irrigation	240	Feb. 21, 1908
41	2	Sophia Kircher, J. Kircher and A. Hibbeln	Camp Creek	260	Irrigation	75	Feb. 21, 1908

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PERMITS TO APPROPRIATE WATER—Continued

No. of Permit	No. of Division	NAME OF APPLICANT	Name of Stream	Estimated Cost	Purpose	Acres Irrigated	Date of Completion
35	2	Hawthorne Ditch Co.	Rapid Creek	500	Irrigation	367.6	Feb. 21, 1909
36	2	George McFarland	Antelope Creek	800	Irrigation	140	Sept. 12, 1908
29	2	Montezuma Gold Mining Co.	Rapid Creek	109,000	Power		Apr. 23, 1910
30	2	J. L. Duncan	Rapid Creek	471,300	Power		Apr. 18, 1909
24	1	William G. Hanks	Morris Creek	140	Irrigation	54.8	Oct. 2, 1910
25	1	William G. Hanks	Morris Creek	170	Irrigation	190.4	Oct. 21, 1910
26	1	William DeVinney	DeVinney Creek	625	Irrigation	209.99	May 11, 1910
28	1	Heinrich Went	Went Creek	1,365	Irrigation	325.92	Nov. 20, 1909
40	2	D. D. and N. S. Tubbs	Chyenne River	13,200	Irrigation	1,140	Nov. 29, 1908
45	2	Hawthorne Ditch Co.	Rapid Creek	5,150	Power		Dec. 10, 1910
29	1	Mr. and Mrs. L. C. Peck and Altie Stennett	Whitney Creek	2,500	Irrigation	638.79	Dec. 15, 1909
49	2	Hill City Electric Power and Mining Company	Spring Creek	27,050	Power		Dec. 15, 1911
46	2	George B. Mansfield	Rapid Creek	310,000	Power		Oct. 1, 1909
20	1	Edmund E. Whitemore	Morse Creek	150	Irrigation	80	Dec. 22, 1908
44	2	A. F. and G. G. Shirk	Shirk Creek	3,362	Irrigation	480	June 23, 1909
41	2	Golden West Mining Co.	Castle Creek	15,500	Power		Dec. 23, 1910
47	2	John and Sarah Goodnick	Goodnick Creek	4,965	Irrigation	400	July 7, 1909
48	2	George and Mary Goodnick	Slim Butte Creek	4,882	Irrigation	560	July 7, 1909
50	2	John Daley	Battle Creek	300	Irrigation	25	Jan. 11, 1909
27	2	Louis Richards	Rapid Creek	105,000	Power		June 15, 1910
32	1	William Jones	Gap Creek	1,000	Irrigation	200	Feb. 18, 1910
30	1	Anton Zimmerman	Zimmerman Creek	500	Irrigation	100	Jan. 24, 1909
31	1	Minnie Zimmerman	Flat Creek	400	Irrigation	170	Jan. 24, 1911
50	2	Eugene Holcomb	Box Elder Creek	2,150	Irrigation	620	Aug. 10, 1909
35	1	George L. Bonefield	Sheep Creek	1,265	Irrigation	151.77	Nov. 2, 1909
33	1	Frank M. Hill	Pearl Creek	670	Irrigation	290.94	Feb. 5, 1910
43	2	Ida L. Hummell	No name	1,276	Irrigation	240	Jan. 25, 1911
52	2	Harry Smith, et al	Cottonwood Creek	1,275	Irrigation	480	Mar. 1, 1910
34	1	Ham and McFarland	Elk Creek	450	Irrigation	262	Aug. 11, 1909
51	2	Annie B. Sprague	Cottonwood Creek	1,900	Irrigation	400	Mar. 8, 1910

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55	2	John L. and Grace M. Maxson.	Lame Johnny Creek	1,350	Irrigation	213	Aug. 19, 1910
59	2	Truman B. Miller	Bend Draw	450	Watering stock		Oct. 24, 1910
35-1	1	Edna Holcomb	Sheep Creek	1,100	Irrigation	255	Nov. 9, 1911
34-1	1	Alice M. Mendenhall	Cow Creek	343	Irrigation	42	Nov. 9, 1909
54	2	George W. and Vina A. Darrow	Stockade Beaver Creek	1,250	Irrigation	394	Oct. 21, 1911
53	2	Fred E. Christiernsson	Rockerville Gulch		Placer mining		Nov. 23, 1910
60	2	Philip S. Engelbrecht	Lame Johnny Creek	700	Irrigation	520	Nov. 23, 1910
56	2	Frank E. McMahon	Spring Creek	2,023	Irrigation	480	Nov. 28, 1911
36	1	Vincent S. Johnson and Clara J. Johnson	Box Elder Creek	2,000	Irrigation	418	Dec. 10, 1911
58	2	Charles Geiger	Spring Creek	750	Irrigation	450	Dec. 17, 1909
57	2	Mont B. Adams		500	Irrigation	100	Dec. 18, 1911
38	1	Henry Schipke	Hansen Creek	750	Irrigation	222	Jan. 4, 1912
40	1	Ewell Hanks	Morse Creek	190	Irrigation	187	Jan. 12, 1910
43	1	Homestake Mining Company	Spearfish Creek	647,000	Power		Feb. 5, 1911
37	1	Albert and Rachel Henderson	Bean Blossom Creek	3,750	Irrigation	505	Jan. 4, 1912
62	2	Mary McMahon	Spring Creek	560	Irrigation	171	Feb. 9, 1911
63	1	Castle Creek Hydraulic Gold Mining Company	Castle Creek	40,000	Mining		Feb. 12, 1914
61	2	John H. O'Neill	Spring Creek	350	Irrigation	74	Feb. 9, 1912
64	2	Frank M. Stewart et al	Beaver Creek	30,000	Power		Mar. 6, 1912
44	1	Eva A. O'Connor	Puma Creek	958	Irrigation	100	Aug. 18, 1912
41	1	John and Mary O'Connor	Lone Tree Creek	1,100	Irrigation	298	Mar. 22, 1912
42	1	Mary and Patrick R. O'Connor	White Hawk Creek	800	Irrigation	146	Mar. 22, 1912
45	1	Guy E. Brant	Roundout Creek	825	Irrigation	160	Apr. 12, 1912
65	2	Harrie M. Sprague	Sprague Draw	3,900	Irrigation	720	Apr. 2, 1912
66	2	Jennie Scriber	Limestone Creek	100	Irrigation	65	May 25, 1912
48	1	Todd M. Pettigrew	Spearfish Creek	240	Power		May 31, 1910
47	1	Louise J. Gilbert	Faulkner Creek	360	Irrigation	148	May 31, 1910
46	1	Vini Bernard	Bitter Creek	1,160	Irrigation	124	May 31, 1910
49	1	Louis K. Wilson	Rabbit Creek		Irrigation	106	June 15, 1910
67	2	May J. Downen	French Creek	1,850	Irrigation	624	June 12, 1911
50	1	Georgie E. Wilson	Antelope Draw		Irrigation	20	June 15, 1910
51	1	Dean Witcher	Witcher Draw		Irrigation	78	June 15, 1910
68	2	Charles L. Edgerton	French Creek	500	Irrigation	310	June 12, 1911
69	2	Charles L. Edgerton	French Creek	350	Irrigation	60	June 12, 1911
53-1	1	Nicholas and Ida Stetter	Frozen Horse Creek	1,200	Irrigation	372	June 28, 1912
70-2	2	The Dakota Power Co.	Rapid Creek	40,000	Power		July 21, 1913
54-1	1	Andrew Patchell et al	Gap Creek		Irrigation	478	July 12, 1912
71-2	2	Col. James A. Clark	Spring Creek	22,500	Power		Aug. 9, 1912
73-2	2	Otho Develpoment & Power Co.	Iron Creek	18,000	Power		Oct. 12, 1912
50-1	1	F. W. Bock et al	Little Rapid Creek	95,500	Power		Oct. 8, 1914

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PERMITS TO APPROPRIATE WATER—Continued

No. of Permit	No. of Division	NAME OF APPLICANT	Name of Stream	Estimated Cost	Purpose	Acres Irrigated	Date of Completion
76–2	2	Albert S. Halley et al	Rapid Creek	150	Mining		Nov. 19, 1910
72–2	2	Oluf Johnson	Spring Creek	950	Irrigation	240	Oct. 19, 1910
58–1	1	Harvey Bingoman	South Valley Creek	631	Irrigation	70	Nov. 16, 1910
61–1	1	Myrtle S. Fugate	Sand Creek	593	Irrigation	182	May 16, 1911
59–1	1	John Nell	Nell Creek	1,045	Irrigation	68	Nov. 16, 1910
62–1	1	Daisy A. Davis	Softwater Draw	737	Irrigation	104	Completed
60–1	1	Joseph A. Sateren	Crooked Creek	140	Irrigation	150	Nov. 16, 1910
57–1	1	Daniel M. Tartar	North Slick Creek	1,440	Irrigation	160	June 22, 1912
63–1	1	Lawrence C. Millen et al	Box Elder Creek	925	Irrigation	183	Nov. 19, 1912
55–1	1	John Martin	East Flat Creek	960	Irrigation	320	Completed
75–2	2	Spring Creek Ditch Company	Spring Creek	2,423	Irrigation	2,593	Dec. 20, 1912
65–1	1	E. B. Miller et al	Elk Creek	3,000	Irrigation	1,660	Jan. 18, 1913
66–1	1	Douglas P. Rose	Bear Butte Creek	205	Irrigation	52	Sept. 24, 1910
64–1	1	John H. Livingston	Rabbit Creek	1,350	Irrigation	400	Dec. 21, 1913
67–1	1	Edwin F. Hall et al	Antelope Creek	1,200	Irrigation	240	Mar. 14, 1911
68–1	1	Etta M. Hall	Hall Draw	400	Irrigation	80	Mar. 14, 1911
72–1	1	Todd M. Pettigrew	Spearfish Creek	70,000	Power		Nov. 2, 1911
73–1	1	Mabel Wilson	Cheap John Creek	840	Irrigation	92	May 2, 1913
75–1	1	Helen G. Davis	South Fork of Grand River	1,500	Irrigation	174	Apr. 12, 1913
74–1	1	Guiletti G. Davis	South Fork of Grand River	1,000	Irrigation	85	Apr. 12, 1913
70–1	1	Mary J. Lang	Lang Draw	960	Irrigation	110	Apr. 20, 1913
71–1	1	James A. Weaver	Lone Tree Creek	480	Irrigation	55	Apr. 21, 1913
69–1	1	Norman F. Crouch	Brushy Creek	640	Irrigation	82	Apr. 25, 1913
74–2	2	H. W. Hinrichs	Rapid Creek	103,000	Power		Dec. 6, 1911
52–1	1	Black Hills Traction Co	Cox's Lake	350	Power		June 6, 1911
77–1	1	Alice Kelley	Brushy Creek	840	Irrigation	64	May 31, 1913
78–2	2	Engelbrecht Irrigation Co	Lame Johnny Creek	2,500	Irrigation	940	June 6, 1913
76–1	1	Wm. W. Mitchell	Springs	900	Irrigation	20	May 14, 1911
78–1	1	Roger Moran	Smith Creek	400	Irrigation	35	June 20, 1913
80–2	2	L. D. Taylor et al	Box Elder Creek	300	Irrigation	680	July 6, 1911
81–2	2	Otto Nordstrom et al	French Creek	700	Irrigation	149	Sept. 7, 1915

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Under the provisions of the Water Code of South Dakota, all persons who have acquired a permit in due form for the appropriation of water from streams within the state, are, upon the completion of their irrigation works and the application of the water to beneficial use, required to furnish the State Engineer due proof of same. Upon the receipt of sufficient proof in the State Engineer's office a water license to the applicant is then issued. Since the enactment of the present Water Code a number of such licenses have been issued. In some cases where the parties obtaining the permit were making use of the water on desert claims, they have desired a certificate for the land office to the effect that they were entitled to a water right under the laws of the state of South Dakota, on account of having obtained a permit to the use of the water, and having submitted proof of the completion of the diversion works therefor and of application of the water to beneficial use. The following is a list of those parties who have obtained water licenses or such certificates as are designated:

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WATER LICENSES GRANTED

No. of Permit	NAME	Priority	Source
7	Black Hills Traction Co.....	Sep. 13, 1906	Redwater river and Crow creeks
20	Mrs. A. H. Bolt.....	Aug. 15, 1907	Hatch creek
2	Mattie S. Burke and Isaac M. Murphy.....	June 23, 1906	Box Elder creek
17	Bertha G. Davis.....	June 27, 1907	Sage creek
4	Agnes Fieldsend	July 16, 1906	Hazel and Fieldsend creek
3	Wm. M. Fieldsend.....	July 16, 1906	Fieldsend creek
58	Charles Geiger	Sep. 1, 1908	Spring creek
14	Clyde C. Gilbert.....	Apr. 15, 1907	Gilbert's South Gulch
47	John, Sarah and Daniel Goodnick	Mar. 31, 1908	Goodnick creek
76-2	Albert S. and James Halley.....	Sep. 20, 1909	Rapid creek
35	Hawthorne Ditch Company.....	Oct. 1, 1907	Rapid creek
3	Isabel S. Humphrey.....	July 3, 1906	Hawk's Nest gulch
4	Isabel S. Humphrey.....	July 3, 1906	Band Lands draw
32	William C. Jones.....	June 1, 1908	Gap creek
32	Albert M. Willard.....	June 1, 1908	Gap creek
5	August Mallow	Oct. 18, 1906	Hay draw
44	A. F. and G. G. Shirk.....	Mar. 31, 1908	Shirk creek
26	Water, Light and Power Co.....	June 13, 1907	Fall river
7	G. W. Wattles.....	Nov. 15, 1906	Springer's springs
50	Georgia E. Wilson.....	Apr. 14, 1909	Antelope draw
38	William G. Phillips.....	Nov. 12, 1907	Box Elder creek
40	Ewell Hanks	Nov. 12, 1908	Morse creek

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WATER LICENSES GRANTED—Continued

County	Amount Sec. Ft.	Use	Land
Lawrence	150	Generation of electric power.....	
Meade	1	Irrigation	SW¼ SE¼ Sec. 18, T. 4 N., R. 6 E.
Pennington ...	6	Irrigation	S½ and NE¼ Sec. 22, T. 2 N., R. 8 E.
Harding	4	Irrigation	SW¼ SW¼ Sec. 13, T. 16 N., R. 1 E.; W½ SE¼, SE¼ NE¼ Sec. 14, T. 16 N., R. 1 E.
Butte	2½	Irrigation	SE¼ SW¼ Sec. 22; NE¼ NW¼ Sec. 27; SE¼ NW¼, NE¼ SW¼, NW¼ SE¼, NE¼ SE¼ Sec. 27; NW¼ SE¼, NE¼ SW¼ Sec. 26, T. 8 N., R. 1 E.
Butte	1½	Irrigation	SW¼ NE¼, NW¼ NE¼ Sec. 33; SW¼ SE¼, SE¼ SE¼ Sec. 28; SW¼ SW¼, NW¼ SW¼ Sec. 27, T. 8 N., R. 1 E.
Pennington ...	3	Irrigation	SE¼ of Sec. 14; E½ NW¼ Sec. 23; W½ NE¼ Sec. 23; NW¼ SE¼ Sec. 23; S½ NW¼ Sec. 14; SW¼ NE¼ Sec. 14, T. 2 S., R. 9 E. B. H. M.
Butte	2	Irrigation	N½ SE¼ Sec. 1, T. 16 N., R. 2 E.; lot 6, NE¼ SW¼ Sec. 6, T. 16 N., R. 3 E.
Fall River	4	Irrigation	SE¼ SE¼ Sec. 23; E½ NE¼, SW¼ NE¼, NW¼ SE¼ Sec. 26; NW¼, W½ NE¼ Sec. 25, T. 11 S., R. 9 E.
Pennington ...	2	Placer mining	
Pennington ...	5½	Irrigation	N½ NW¼, E½ NE¼, NW¼ NE¼ Sec. 19; SW¼, W½ NW¼, SE¼ NW¼, W½ SE¼, SE¼ SE¼ Sec. 18, T. 1 N., R. 9 E.
Pennington ...	1½	Irrigation	SW¼ NW¼, lot 4, N½, NE¼ NW¼ Sec. 1, T. 1 N., R. 10 E.
Pennington ...	1¾	Irrigation	W½ SE¼, NE¼, lot 1, E½ and NW¼ of lot 2, E½, SW¼ NE¼ Sec. 1, T. 1 N., R. 10 E.
Perkins	2¼	Irrigation	NW¼ NW¼, NE¼ NW¼, SW¼ NW¼, SE¼ NW¼ Sec. 4, T. 17 N., R. 10 E.
Perkins	¾	Irrigation	NW¼ SW¼, SW¼ SW¼, SE¼ SW¼ Sec. 32, T. 18 N., R. 10 E.
Pennington ...	4.77	Irrigation	SW¼ and NW¼ Sec. 26; NE¼ Sec. 27; SE¼ Sec. 22; SW¼ Sec. 29, T. 1 S., R. 13 E.
Fall River.. ..	5	Irrigation	SW¼ Sec. 19; SE¼ Sec. 30; NE¼ Sec. 31, T. 11 S., R. 8 E.
Fall River	25	Mining, milling, irrigation and power...	
Fall River	1	Irrigation	S½ of Sec. 10; SE¼ of Sec. 15, T. 7 S., R. 5 E.
Perkins	1	Irrigation	SE¼ SE¼ Sec. 27, T. 16 N., R. 13 E.
Pennington ...	2	Irrigation	S½ NE¼, N½ SE¼, SE¼ SE¼ Sec. 8, T. 1 N., R. 12 E.
Meade	3	Irrigation	S½ Sec. 24, T. 4 N., R. 6 E.

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Dry Draw Filings

Many persons have taken advantage of Section 31, of the State Water Code, relating to constructing dams across dry draws. The requirement necessitates the filing of a copy of the location notice in the office of the State Engineer. The following list comprises the location notices that have been filed in this office since the enactment of the law.

LIST OF FILINGS ON DRY DRAWS

Division No. 1

Number	Name of Appropriator	Location of Dam
1	Re Charles Hammerschmidt	SE¼ SW¼ Sec. 22, T. 7 N., R. 6 E. BHM
2	Re Charles Hammerschmidt	SE¼ SW¼ Sec. 22, T. 7 N., R. 6 E. BHM
3	Re Charles Hammerschmidt	SW¼ SW¼ Sec. 22, T. 7 N., R. 6 E. BHM
4	Elizabeth A. Fisher	SW¼ SE¼ Sec. 5, T. 8 N., R. 1 E. BHM
5	Joseph W. Couch	NE¼ Sec. 10, NW¼ Sec. 11, and S½ Sec. 3, T. 8 N., R. 1 E. BHM
6	John E. Lindgren	SW¼ SW¼ Sec. 5, and SE¼ SE¼ Sec. 6, T. 9 N., R. 2 E. BHM
7	Sarah A. Ash	SE¼ SE¼ Sec. 4, T. 14 N., R. 16 E. BHM
8	Ben C. and Harvery R. Ash	N½ SE¼ Sec. 31, T. 15 N., R. 16 E. BHM
9	John A. Scotney	SW¼ NW¼ Sec. 17, T. 8 N., R. 2 E. BHM
10	Carl Wahl	SE¼ SE¼ Sec. 22, T. 8 N., R. 11 E. BHM
11	Jacob Wahl	SE¼ NW¼ Sec. 25, T. 8 N., R. 11 E. BHM
12	Bertha T. Vance	SE¼ SW¼ Sec. 19, T. 8 N., R. 14 E. BHM
13	Bertha T. Vance	Lot 1, Sec. 30, T. 8 N., R. 14 E. BHM
14	Hugh Vance	NW¼ SE¼ Sec. 27, T. 8 N., R. 14 E. BHM
15	Pearl C. Ham	NE¼ NW¼ Sec. 32, T. 4 N., R. 8 E. BHM
16	Emerson Crowell	NE¼ SW¼ Sec. 23, T. 6 N., R. 15 E. BHM
17	Peter E. Christensen	NE¼ NW¼ Sec. 2, T. 12 S., R. 6 E. BHM
20	Abbie E. Andrews	SE¼ NW¼ Sec. 26, T. 12 N., R. 1 E. BHM
21	Eugene F. Brown	E½ NW¼ Sec. 5, T. 10 N., R. 16 E. BHM
22	Fred Jennewein, et al	NE¼ Sec. 18, T. 19 N., R. 13 E. BHM
23	Aberhardt Johnson	Lot 2, Sec. 3, T. 3 N., R. 8 E. BHM
24	Frederick Richter	SE¼ NE¼ Sec. 1, T. 7 N., R. 13 E. BHM
25	Clifton L. Freeman	S½ SE¼ Sec. 9, T. 12 N., R. 1 E. BHM
26	Edward Mineault	SW¼ Sec. 21, T. 18 N., R. 10 E. BHM
27	Edward Sundquist	SE¼ NW¼ Sec. 5, T. 8 N., R. 3 E. BHM
28	Joe German	NW¼ SW¼ Sec. 35, T. 23 N., R. 15 E. BHM
29	William Horlocker	SW¼ NE¼ Sec. 27, T. 9 N., R. 13 E. BHM
30	Joseph C. Timmons	E½ NE¼ Sec. 14, T. 8 N., R. 14 E. BHM
31	Alice A. Timmons	W½ Secs. 18 and 19, T. 8 N., R. 15 E. BHM
32	Frank Kvet	SE¼ SW¼ and NE¼ SE¼ Sec. 13, T. 9 N., R. 1 E. BHM
33	Isabelle Lindgren	Lot 3, Sec. 6, T. 9 N., R. 1 E. BHM
34	Osmund T. Sevareid	NE¼ NE¼ Sec. 17, and NE¼ NE¼ Sec. 20, T. 9 N., R. 11 E. BHM
35	Amanda E. Sandusky	NW¼ NE¼ Sec. 23, T. 18 N., R. 9 E. BHM
36	Charles J. Buell	NW¼ NW¼ Sec. 14, T. 7 N., R. 12 E. BHM
37	Paul G. Ames	NE¼ SE¼ Sec. 32, T. 22 N., R. 8 E. BHM
38	Lorenzo P. Reinoehl	NE¼ NW¼ Sec. 5, T. 15 N., R. 14 E. BHM
39	Thomas B. Veal	W½ NE¼ Sec. 26, T. 17 N., R. 15 E. BHM
40	Isaac E. Shoun	NW¼ NW¼ Sec. 1, T. 8 N., R. 13 E. BHM
41	George F. and Caroline E. Degner	NE¼ SE¼ Sec. 7, and SW¼ SW¼ Sec. 5, T. 15 N., R. 14 E. BHM
42	Harry G. Duncan	SW¼ NE¼ Sec. 14, T. 7 N., R. 12 E. BHM
43	Elizabeth Silfven	NE¼ NE¼ Sec. 32, T. 7 N., R. 6 E. BHM
44	David R. Murphy	SW¼ SW¼ Sec. 33, T. 9 N., R. 14 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Number	Name of Appropriator	Location of Dam
45	LeRoy Leach	Lot 3, Sec. 6, T. 4 N., R. 7 E. BHM
46	George W. Packard	NE¼ SE¼ Sec. 13, T. 14 N., R. 11 E. BHM
47	Lotta L. Leister	SE¼ SE¼ Sec. 29, T. 10 N., R. 12 E. BHM
48	Maude A. Richards	SE¼ NE¼ Sec. 30, and NW¼ Sec. 30, T. 8 N., R. 2 E. BHM
49	Michael Crowell	SE¼ NW¼ Sec. 26, T. 7 N., R. 14 E. BHM
50	Maggie Hanks	NW¼ SW¼ Sec. 19, T. 4 N., R. 7 E. BHM
51	Hattie I. Olson	NW¼ NW¼ Sec. 27, T. 20 N., R. 9 E. BHM
52	Mabel S. Horlocker	NE¼ SW¼ Sec. 34, T. 9 N., R. 13 E. BHM
53	A. Garfield Shoun	SW¼ SW¼ Sec. 3, and NE¼ SW¼ Sec. 9, T. 9 N., R. 11 E. BHM
54	Willard J. Ashton	SW¼ SE¼ Sec. 12, T. 9 N., R. 14 E. BHM
55	Mary Harrington	W½ NE¼ Sec. 31, and SW¼ NW¼ Sec. 31, T. 4 N., R. 9 E. BHM
56	Mary Harrington	S½ SW¼ Sec. 19, T. 4 N., R. 9 E. BHM
57	Edgar B. Giles	SW¼ NW¼ Sec. 28, T. 9 N., R. 3 E. BHM
58	Edgar B. Giles	S½ SW¼ Sec. 21, T. 9 N., R. 3 E. BHM
59	Blanch B. Hall	NE¼ NE¼ Sec. 14, T. 13 N., R. 8 E. BHM
60	John E. Carnell	SE¼ SW¼ Sec. 11, T. 8 N., R. 1 E. BHM
61	Dean Witcher	NW¼ NW¼ Sec. 23, T. 16 N., R. 13 E. BHM
62	Joseph P. Collins	SE¼ SW¼ Sec. 2, T. 9 N., R. 15 E. BHM
63	Alfred D. Reder	E½ NE¼ Sec. 31, T. 16 N., R. 12 E. BHM
64	Arthur K. Stout	SE¼ SE¼ Sec. 31, T. 7 N., R. 6 E. BHM
65	John H. Horner	SE¼ NE¼ Sec. 35, T. 10 N., R. 2 E. BHM
66	Em. S. Winkler	SE¼ SW¼ Sec. 3, T. 10 N., R. 5 E. BHM
67	Hynek Nikodyn	SW¼ SE¼ Sec. 28, T. 10 N., R. 1 E. BHM
68	J. A. Oakland	SW¼ SE¼ Sec. 24, T. 10 N., R. 16 E. BHM
69	William Shepard	NE¼ SE¼ Sec. 6, T. 9 N., R. 17 E. BHM
70	Edith Stewart	S½ SW¼ Sec. 35, T. 10 N., R. 14 E. BHM
71	James Watson	SE¼ NE¼ Sec. 7, T. 9 N., R. 16 E. BHM
72	Julia Sorenson	NW¼ SW¼ Sec. 34, T. 16 N., R. 1 E. BHM
73	Homer T. Couch	NW¼ NW¼ Sec. 9, T. 8 N., R. 1 E. BHM
74	Milo Anderson	NE¼ SE¼ Sec. 31, T. 10 N., R. 17 E. BHM
76	John Gallinger	S½ SW¼ Sec. 15, T. 9 N., R. 15 E. BHM
78	Herman S. Bye	NE¼ SW¼ Sec. 35, and NE¼ SW¼ Sec. 34, T. 17 N., R. 1 E. BHM
81	Vinie E. Riffel and Samuel E. Carter	SW¼ SW¼ and SW¼ NE¼ Sec. 30, T. 10 N., R. 12 E. BHM
82	Bertha Riffel	SE¼ NW¼ Sec. 19, T. 10 N., R. 12 E. BHM
83	Samuel E. Carter and Willis A. Richardson	SW¼ NW¼ Sec. 32, T. 10 N., R. 12 E. BHM
84	Joseph T. Riffel	SW¼ SE¼ Sec. 20, T. 10 N., R. 12 E. BHM
85	Frank Riffel	NW¼ NW¼ Sec. 29, T. 10 N., R. 12 E. BHM
86	Jacob Muhlberger	NW¼ NE¼ Sec. 3, T. 10 N., R. 16 E. BHM
87	Mary I. Priest	NW¼ NW¼ Sec. 29, T. 5 N., R. 14 E. BHM
88	John Dunn	SW¼ SE¼ Sec. 31, T. 8 N., R. 17 E. BHM
89	Cassius E. Gorsuch	SE¼ NE¼ Sec. 30, T. 6 N., R. 16 E. BHM
90	Clara Babcock	SE¼ NE¼ Sec. 9, T. 9 N., R. 16 E. BHM
91	Franklin Babcock	SE¼ NE¼ Sec. 7, T. 9 N., R. 17 E. BHM
92	Nellie E. Bartlett	SW¼ SE¼ Sec. 27, T. 9 N., R. 12 E. BHM
93	William Babcock	SW¼ SW¼ Sec. 9, T. 9 N., R. 16 E. BHM
94	James R. Babcock	SW¼ SW¼ Sec. 10, T. 9 N., R. 16 E. BHM
95	Nellie Garhart	Sec. 28, T. 4 N., R. 8 E. BHM
96	Ellen Wilcox	Lot 2, Sec. 7, T. 8 N., R. 11 E. BHM
97	William Kalkbrenner	SE¼ NE¼ Sec. 10, T. 10 N., R. 10 E. BHM
98	James Tucker	NE¼ NE¼ Sec. 11, T. 9 N., R. 10 E. BHM
99	Sarah A. Rhoden	NW¼ NW¼ and NE¼ SW¼ Sec. 22, T. 8 N., R. 12 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Number	Name of Appropriator	Location of Dam
100	Harry Strong	SE¼ NW¼ Sec. 2, T. 6 N., R. 12 E. BHM
101	John Porter	SE¼ SW¼ Sec. 16, T. 7 N., R. 12 E. BHM
102	James Cross	SE¼ NW¼ Sec. 35, T. 7 N., R. 12 E. BHM
103	Christena Kalkbrenner	SW¼ NW¼ Sec. 11, T. 10 N., R. 10 E. BHM
104	William R. Garhart	SE¼ NE¼ Sec. 29, T. 4 N., R. 8 E. BHM
105	Fred Hill	SW¼ SW¼ Sec. 34, T. 11 N., R. 10 E. BHM
106	John J. Heberling	NW¼ SE¼ Sec. 31, T. 10 N., R. 14 E. BHM
107	Charles Strong	NE¼ NW¼ Sec. 2, T. 7 N., R. 13 E. BHM
109	John Jordan	NW¼ NE¼ Sec. 1, T. 9 N., R. 16 E. BHM
110	James Moran	NW¼ SW¼ Sec. 2, T. 2 N., R. 14 E. BHM
111	George Norton	NW¼ NE¼ and NE¼ NW¼ Sec. 29, T. 8 N., R. 11 E. BHM
112	Ursula B. Harnsberger	NW¼ SE¼ Sec. 24, T. 10 N., R. 12 E. BHM
113	Winifred A. Fish	Lot 1, SE¼ NE¼, E½ SE¼ Sce. 6;E½ NE¼, E½ SE¼ Sec. 7, T. 5 N., R. 14 E. BHM
114	Robert C. Hayes and Chas. Herbert	
115	Robert C. Hayes and Chas. Herbert	
116	Joseph W. Burton, Jr.	SE¼ SE¼ Sec. 29, and NW¼ SW¼ Sec. 28, T. 5 N., R. 12 E. BHM
117	Arthur Rainville and Harry Dubuque	NE¼ NW¼ Sec. 26, T. 10 N., R. 3 E. BHM
118	Charles C. and Jennie M. Haas	NW¼ SE¼ Sec. 26, T. 7 N., R. 4 E. BHM
119	Knud P. Christensen	Lot 1 of NW¼ Sec. 18, T. 4 N., R. 8 E. BHM
120	Knud P. Christensen	NE¼ NE¼ Sec. 18, T. 4 N., R. 8 E. BHM
121	George L. Howard	NE¼ NE¼ Sec. 26, T. 21 N., R. 8 E. BHM
122	Wm. F. and Bessie McNenny	SE¼ NW¼ Sec. 15, T. 5 N., R. 9 E. BHM
123	William F. McNenny	NE¼ SE¼ Sec. 16, T. 5 N., R. 9 E. BHM
124	Homer T. Couch	NW¼ SW¼ Sec. 4, T. 8 N., R. 1 E. BHM
125	William E. Fish	SW¼ Sec. 12, T. 16 N., R. 7 E. BHM
126	Walter N. and William F. Schroeder, Jr. (relinquished)	NW¼ Sec. 1, T. 16 N., R. 7 E. BHM
127	Walter N. and William F. Schroeder, Jr.	NE¼ Sec. 35, T. 17 N., R. 7 E. BHM
128	Co. Shirley	S½ NW¼ Sec. 9, T. 21 N., R. 9 E. BHM
129	John W. Hoover	SE¼ NE¼ and NE¼ SE¼ Sec. 16, T. 13 N., R. 7 E. BHM
130	John Zirchling	SE¼ NW¼ Sec. 18, T. 10 N., R. 1 E. BHM
131	Delos Olson	SW¼ SW¼ Sec. 22, T. 20 N., R. 9 E. BHM
132	Rauswell B. McPherson	SE¼ NE¼ Sec. 32, T. 5 N., R. 9 E. BHM
133	Rauswell B. McPherson	NE¼ SE¼ Sec. 32, T. 5 N., R. 9 E. BHM
134	Mrs. W. S. Eddy	SW¼ SW¼ Sec. 6, T. 10 N., R. 17 E. BHM
135	Susan Shepard	SW¼ SW¼ Sec. 5, T. 9 N., R. 17 E. BHM
136	W. S. Eddy	SE¼ NE¼, NE¼ SE¼ Se c. 10; NW¼ SW¼, SW¼
137	Myrtle M. Crouse	SE¼ NE¼, NE¼ SE¼ Sec. 10; NW¼ SW¼, SW¼ NW¼ Sec. 11, T. 12 N., R. 17 E. BHM
138	Frederick Richter	Lot 2, Sec. 1, T. 7 N., R. 13 E. BHM
139	Joseph Ripple	NW¼ SE¼ Sec. 11, T. 10 N., R. 15 E. BHM
140	Charles E. Alder	SW¼ NW¼ Sec. 12, T. 9 N., R. 15 E. BHM
141	James Ripple	SW¼ SE¼ Sec. 11, T. 7 N., R. 15 E. BHM
142	Myrtle M. Crouse	SE¼ Sec. 10, T. 12 N., R. 17 E. BHM
143	John Salmen	SW¼ NE¼ Sec. 21, T. 21 N., R. 2 E. BHM
144	George H. Goff	SW¼ NW¼ Sec. 9, T. 7 N., R. 15 E. BHM
145	Albertus B. Altfillisch	SW¼ NW¼ Sec. 4, T. 9 N., R. 17 E. BHM
146	Tivis and Tivis	NE¼ NW¼ Sec. 30, T. 7 N., R. 16 E. BHM
147	John Hoyle	NE¼ SE¼ Sec. 33, T. 11 N., R. 16 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Number	Name of Appropriator	Location of Dam
148	Mrs. O'Tillie Sailer	SE¼ SW¼ Sec. 12, T. 10 N., R. 15 E. BHM
149	Charles Goff	SW¼ NE¼ Sec. 28, T. 7 N., R. 15 E. BHM
150	William F. Schroeder, Jr.	NE¼ NW¼ Sec. 35, T. 17 N., R. 7 E. BHM
151	Homer T. Couch	SE¼ SW¼ Sec. 4, T. 8 N., R. 1 E. BHM
152	Elizabeth M. Heberling	W½ NE¼ Sec. 8, T. 9 N., R. 14 E. BHM
153	John C. Helms	NE¼ Sec. 28, T. 18 N., R. 8 E. BHM
154	William Doolittle	NE¼ Sec. 24, T. 18 N., R. 6 E. BHM
155	William F. Schroeder, Jr.	SW¼ Sec. 26, T. 17 N., R. 7 E. BHM
156	Walter N. Schroeder	NW¼ Sec. 26, T. 17 N., R. 7 E. BHM
157	Thomas J. Marks	SW¼ Sec. 9, T. 16 N., R. 7 E. BHM
158	Leta Mariner	Lot 3, Sec. 4, and SE¼ NW¼ Sec. 4, T. 5 N., R. 13 E. BHM
159	Charles P. McPherson	SE¼ SW¼ Sec. 32, T. 5 N., R. 9 E. BHM
160	Charles P. McPherson	NE¼ SW¼ and SE¼ NW¼ Sec. 5, T. 4 N., R. 9 E. BHM
161	Clara M. McPherson	N½ SE¼ Sec. 5, T. 4 N., R. 9 E. BHM
162	Clara M. McPherson	NW¼ SE¼ Sec. 5, T. 4 N., R. 9 E. BHM
163	Clara M. McPherson	SE¼ NE¼ Sec. 5, T. 4 N., R. 9 E. BHM
164	Edith E. Mitchell	E½ NW¼ and NE¼ Sec. 24, T. 18 N., R. 1 E. BHM
165	Mrs. Nellie S. Smith	SE¼ Sec. 19, T. 20 N., R. 11 E. BHM
166	Mrs. Nellie S. Smith	SW¼ Sec. 20, T. 20 N., R. 11 E. BHM
167	Sarah M. Smith	SE¼ Sec. 20, T. 20 N., R. 11 E. BHM
168	George A. Williams	SW¼ NW¼ Sec. 21, T. 20 N., R. 11 E. BHM
169	Abel Mathias	NW¼ NW¼ Sec. 36, T. 5 N., R. 12 E. BHM
170	John T. Moore	NE¼ SE¼ Sec. 2, T. 4 N., R. 9 E. BHM
171	John T. Moore	NW¼ SW¼ Sec. 1, T. 4 N., R. 9 E. BHM
172	John T. Moore	NE¼ SW¼ Sec. 1, T. 4 N., R. 9 E. BHM
173	John T. Moore	NW¼ SE¼ Sec. 1, T. 4 N., R. 9 E. BHM
174	Mrs. Jennie Ashley	NE¼ NW¼ Sec. 26, T. 12 N., R. 10 E. BHM
175	Scott W. Burton	NW¼ NW¼ Sec. 22, T. 5 N., R. 12 E. BHM
176	Mary S. Burton	NW¼ NW¼ Sec. 26, T. 5 N., R. 12 E. BHM
177	Nelson W. Brooks	NE¼ Sec. 17, T. 8 N., R. 8 E. BHM
178	Zora M. Goff	NE¼ NE¼ Sec. 12, T. 10 N., R. 2 E. BHM
179	James E. and Lucile Horton	W½ SW¼ Sec. 19, T. 16 N., R. 8 E. BHM
180	Lucile Horton	NW¼ NW¼ Sec. 25, T. 16 N., R. 7 E. BHM
181	John Omat	NE¼ NE¼ Sec. 30; S½ SE¼ and NE¼ SE¼ Sec. 19, T. 19 N., R. 5 E. BHM
182	Carrie L. Mack	NE¼ NW¼ Sec. 12, T. 3 N., R. 9 E. BHM
183	Otto Nilsson	NW¼ SW¼ Sec. 34, T. 4 N., R. 8 E. BHM
184	Otto Nilsson	NW¼ NW¼ Sec. 34, T. 4 N., R. 8 E. BHM
185	James M. Eaton	SE¼ NW¼ Sec. 9, T. 8 N., R. 3 E. BHM
186	James M. Eaton	NE¼ NE¼ Sec. 8, T. 8 N., R. 3 E. BHM
187	Willie Shepard	N½ SE¼ Sec. 6, T. 9 N., R. 17 E. BHM
188	Susan and Willie Shepard	NE¼ SE¼ Sec. 6, T. 9 N., R. 17 E. BHM
189	Susan Shepard	SW¼ SW¼ Sec. 5, T. 9 N., R. 17 E. BHM
190	George W. Shepard	SW¼ NE¼ Sec. 23, T. 9 N., R. 17 E. BHM
191	Rosa Ingalls	SE¼ SE¼ Sec. 27, T. 11 N., R. 12 E. BHM
192	Rosa Ingalls	SW¼ SE¼ Sec. 27, T. 11 N., R. 12 E. BHM
193	Rosa Ingalls	NW¼ SE¼ Sec. 27, T. 11 N., R. 12 E. BHM
194	Rosa Ingalls	NW¼ SW¼ Sec. 27, T. 11 N., R. 12 E. BHM
195	Rosa Ingalls	NE¼ SW¼ Sec. 27, T. 11 N., R. 12 E. BHM
196	Rosa Ingalls	NW¼ SW¼ Sec. 27, T. 11 N., R. 12 E. BHM
197	Elizabeth Ingalls	NW¼ SW¼ Sec. 22, T. 11 N., R. 12 E. BHM
198	Paul G. Ames	Lot 1, Sec. 5, T. 21 N., R. 8 E. BHM
199	Bertha Trummer	SE¼ NE¼ Sec. 24, T. 13 N., R. 7 E. BHM
200	Jessie F. Devers	NE¼ SE¼ Sec. 30, T. 4 N., R. 8 E. BHM
201	William Mohr	NE¼ NW¼ Sec. 13, T. 10 N., R. 12 E. BHM
202	Henry Mohr	SW¼ SW¼ Sec. 12, T. 10 N., R. 12 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Number	Name of Appropriator	Location of Dam
203	Annie Richards	NW¼ NW¼ and E½ NW¼ Sec. 14, T. 8 N., R. 1 E. BHM
204	Mrs. Virginia Maud Johnson	Sec. 29, T. 8 N., R. 3 E. BHM
205	Neils P. M. Jorensen	S½ SE¼ Sec. 12, T. 4 N., R. 7 E. BHM
206	Neils P. M. Jorensen	SW¼ SW¼ Sec. 12, T. 4 N., R. 7 E. BHM
207	Arthur H. Oliver	NW¼ SE¼ Sec. 5, T. 4 N., R. 11 E. BHM
208	Arthur H. Oliver	SE¼ NE¼ Sec. 5, T. 4 N., R. 11 E. BHM
209	Edith Stewart	S½ SW¼ Sec. 35, T. 10 N., R. 14 E. BHM
210	Christ Jost	NE¼ SW¼ Sec. 28, T. 8 N., R. 1 E. BHM
211	Alfred Peterson	NE¼ SW¼ Sec. 14, T. 10 N., R. 14 E. BHM
212	Valens Palmer	SE¼ NW¼ Sec. 25, T. 10 N., R. 14 E. BHM
213	Mrs. Edith E. Mitchell	NE¼ NE¼ Sec. 23, T. 18 N., R. 8 E. BHM
214	Thomas P. McPharlin	NE¼ SW¼ Sec. 29, T. 19 N., R. 5 E. BHM
215	Thomas P. McPharlin	NW¼ SW¼ Sec. 29, T. 19 N., R. 5 E. BHM
216	Elijah W. Griffith	SE¼ NW¼ Sec. 3, T. 20 N., R. 1 E. BHM
217	William Johnson	N½, NW¼ NW¼ Sec. 21, and NW¼ Sec. 20, T. 20 N., R. 4 E. BHM
218	Mina M. Giles	NE¼ NE¼ Sec. 20, T. 9 N., R. 3 E. BHM
219	Mina M. Giles	NE¼ NE¼ Sec. 20, T. 9 N., R. 3 E. BHM
220	Alanson Giles	SW¼ NE¼ Sec. 21, T. 9 N., R. 3 E. BHM
221	Wallace W. Hurd	NW¼ NW¼ Sec. 12, T. 20 N., R. 3 E. BHM
222	Richard H. Shrewsbury	SE¼ NW¼ Sec. 23, T. 18 N., R. 2 E. BHM
223	Harriett E. Wilson	NE¼ NW¼ Sec. 31, T. 20 N., R. 3 E. BHM
224	Harriett E. Wilson	NE¼ SE¼ Sec. 31, T. 20 N., R. 3 E. BHM
225	Harriett E. Wilson	SW¼ SE¼ Sec. 31, T. 20 N., R. 3 E. BHM
226	John M. Rohan	SE¼ NE¼ Sec. 13, T. 10 N., R. 16 E. BHM
227	M. Edna Moses	SW¼ SW¼ Sec. 26, T. 13 N., R. 12 E. BHM
228	Attia B. Moses	NW¼ SE¼ Sec. 26, T. 13 N., R. 12 E. BHM
229	Attia B. Moses	SE¼ NE¼ Sec. 36, T. 13 N., R. 12 E. BHM
230	David H. Vrooman	NW¼ SW¼ Sec. 29, T. 14 N., R. 12 E. BHM
231	Castle S. Jackson and Byron K. Jackson	SW¼ NE¼, NW¼ SE¼, NE¼ SW¼, SE¼ NW¼ Sec. 17, T. 21 N., R. 2 E. BHM
232	Mary Frances Mutchler	SW¼ SE¼ Sec. 14, T. 10 N., R. 9 E. BHM
233	Mary Frances Mutchler	NW¼ SE¼ Sec. 14, T. 10 N., R. 9 E. BHM
234	Mary Frances Mutchler	SE¼ SW¼ Sec. 13, T. 10 N., R. 9 E. BHM
235	Henry Mutchler	SE¼ NE¼ Sec. 13, T. 10 N., R. 9 E. BHM
236	Henry Mutchler	NW¼ NE¼ Sec. 13, T. 10 N., R. 9 E. BHM
237	William C. Robinson	NE¼ SW¼ Sec. 32, T. 18 N., R. 8 E. BHM
238	William C. Robinson	SE¼ SW¼ Sec. 32, T. 18 N., R. 8 E. BHM
239	Griffith Robinson	SE¼ NE¼ Sec. 7, T. 17 N., R. 8 E. BHM
240	Griffith Robinson	SW¼ Sec. 8, T. 17 N., R. 8 E. BHM
241	Ray R. Fisher	NW¼ NE¼ Sec. 26, T. 18 N., R. 2 E. BHM
242	Olaf Ed Wickstrom	NW¼ NW¼ Sec. 29, T. 20 N., R. 7 E. BHM
243	George H. Hiltoner	E½, SW¼, W½ SE¼ Sec. 36, T. 21 N., R. 4 E.; NW¼ NE¼ NE¼ NW¼ Sec. 1, T. 20 N., R. 4 E. BHM
244	Abe Jones	NE¼ SE¼ Sec. 29, T. 18 N., R. 8 E. BHM
245	Jerry C. Gleason	Sec. 24, T. 18 N., R. 3. E. BHM
246	Griffith Robinson	SW¼ SW¼ Sec. 5, T. 17 N., R. 8 E. BHM
247	George Clark	E½ SE¼ Sec. 19; W½ SW¼ Sec. 20, T. 21 N., R. 6 E. BHM
248	Daniel V. Gilbert	NE¼ NW¼ Sec. 8, T. 12 N., R. 9 E. BHM
249	Louis J. Beck	N½ NW¼ Sec. 23, T. 20 N., R. 1 E. BHM
250	George W. Devers	NW¼ SW¼ Sec. 17; NE¼ SE¼ Sec. 18, T. 4 N., R. 8 E. BHM
251	George C. Winkler	NE¼ SW¼ Sec. 2, T. 10 N., R. 5 E. BHM
252	Joe H. Winkler	SW¼ SW¼ Sec. 2, T. 10 N., R. 5 E. BHM
253	Joe H. Winkler	SW¼ SW¼ Sec. 2, T. 10 N., R. 5 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Number	Name of Appropriator	Location of Dam
254	Thomas P. McPharlin.....	SW¼ Sec. 6, T. 18 N., R. 4 E. BHM
255	Heming B. Bomford.....	SE¼ NE¼ Sec. 15, T. 12 N., R. 2 E. BHM
256	The Tivis, Clark and Barber Dry Draw Project...	SW¼ SW¼ Sec. 32, NE¼ SE¼ Sec. 32, NE¼ SW¼, SE¼ SE¼ Sec. 5, T. 7 N., R. 16 E. BHM
257	John T. Thompson.....	E½ SW¼ Sec. 19, SW¼ SW¼ Sec. 20, T. 18 N., R. 9 E. BHM
258	Rufus A. Smith.....	SW¼ SE¼ Sec. 5, T. 8 N., R. 13 E. BHM
259	Rufus A. Smith.....	SE¼ SE¼ Sec. 5, T. 8 N., R. 13 E. BHM
260	Kust Merilainen	Lot 6 of Sec. 5, T. 20 N., R. 2 E. BHM
261	John L. Simon.....	NE¼ SE¼ Sec. 25, T. 7 N., R. 12 E. BHM
262	Emily E. Sloan.....	NW¼ SW¼ Sec. 28, T. 12 N., R. 1 E. BHM
263	Fred F. Wilson.....	NE¼ SE¼, NE¼ NE¼ Sec. 18, T. 12 N., R. 9 E. BHM
264	George C. Altemus.....	NW¼ SE¼ Sec. 27, T. 7 N., R. 12 E. BHM
265	William W. Johnson.....	NE¼ SE¼, SE¼ NW¼ Sec. 13, T. 8 N., R. 17 E. BHM
266	Oliver Oakland	NW¼ NW¼ Sec. 31, T. 10 N., R. 17 E. BHM
267	Georgia Van Camp.....	NW¼ SE¼ Sec. 22, T. 11 N., R. 17 E. BHM
268	George W. Duck.....	SW¼ SW¼ Sec. 15, T. 10 N., R. 17 E. BHM
269	Eddie H. Anderson.....	NE¼ NE¼, NW¼ SE¼ Sec. 9, T. 9 N., R. 17 E. BHM
270	E. W. Riggle.....	NE¼ NW¼ Sec. 13, T. 10 N., R. 17 E. BHM
271	R. M. Waddell.....	NE¼ SE¼ Sec. 34, T. 9 N., R. 17 E. BHM
272	Andrew Peterson and August Tokola	NW¼ SW¼ of lot 3, Sec. 7, T. 20 N., R. 3 E. BHM
273	Andrew Peterson and August Tokola	SE¼ SW¼ Sec. 6, T. 20 N., R. 3 E. BHM
274	Albert Sampont	NW¼ SW¼ Sec. 24, T. 13 N., R. 9 E. BHM
275	John Waddell	SE¼ SE¼ Sec. 34, T. 9 N., R. 17 E. BHM
276	Ida Waddell	SW¼ SW¼ Sec. 3, T. 8 N., R. 17 E. BHM
277	Ida Waddell	SW¼ SW¼ Sec. 2, T. 8 N., R. 17 E. BHM
278	Arthur K. Stout.....	SE¼ SE¼ Sec. 31, T. 7 N., R. 6 E. BHM
279	Alexander H. Rogers.....	SW¼ SE¼ Sec. 29, T. 10 N., R. 8 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Division No. 2

Number	Name of Appropriator	Location of Dam
1	C. L. Johnson	SE¼ Sec. 4, T. 12 S., R. 3 E. BHM
2	Gazille Johnson	SW¼ Sec. 8, T. 12 S., R. 3 E. BHM
3	Joseph L. Ashton	SE¼ SW¼ Sec. 2, T. 12 S., R. 2 E. BHM
4	Nathan D. Wheeler	NE¼ NW¼ Sec. 27, T. 10 S., R. 1 E. BHM
5	Ada McDermand	NE¼ SW¼ Sec. 31, T. 4 S., R. 8 E. BHM
6	Ella Gull	NE¼ NE¼ Sec. 33, and NW¼ SW¼ Sec. 28, T. 5 S., R. 3 E. BHM
7	John C. Parkin	SW¼ SE¼ Sec. 34, T. 9 S., R. 3 E. BHM
8	William C. Trompeter	Sec. 9, T. 9 S., R. 3 E. BHM
9	Theodore Rasmussen	SE¼ NW¼ Sec. 4, and SE¼ NE¼ Sec. 4, T. 5 S., R. 8 E. BHM
10	Annie E. Tucker	Sec. 35, T. 10 S., R. 2 E. BHM
11	Stephen A. Douglas Tucker	Sec. 35, T. 10 S., R. 2 E. BHM
12	Lyda Ward	NE¼ Sec. 34, T. 8 S., R. 2 E. BHM
13	Lyda Ward	NE¼ Sec. 34, T. 8 S., R. 2 E. BHM
14	Eliza J. Parkin	NE¼ Sec. 35, T. 10 S., R. 2 E. BHM
15	Laura J. Mudge	Sec. 35, T. 10 S., R. 2 E. BHM
16	Emma S. Ryan	W½ NW¼ Sec. 3, T. 6 S., R. 8 E. BHM
17	Jesse M. Rineer	NE¼ SE¼ Sec. 34, T. 11 S., R. 4 E. BHM
18	Charles H. Petro	SW¼ NE¼ Sec. 23, T. 10 S., R. 3 E. BHM
19	John W. Tidd	Sec. 11, T. 12 S., R. 1 E. BHM
20	John W. Tidd	Sec. 11, T. 12 S., R. 1 E. BHM
21	W. B. Woodruff	Sec. 14, T. 12 S., R. 1 E. BHM
22	W. B. Woodruff	Sec. 14, T. 12 S., R. 1 E. BHM
23	W. B. Woodruff	Sec. 14, T. 12 S., R. 1 E. BHM
24	W. B. Woodruff	Sec. 14, T. 12 S., R. 1 E. BHM
25	Eva L. and Orn B. Williams	SE¼ SE¼ Sec. 31, T. 11 S., R. 3 E. BHM
26	Margaret Wiedenfelt	NE¼ SW¼ Sec. 15, T. 12 S., R. 3 E. BHM
27	John Wilkinson	NW¼ NE¼ Sec. 31, T. S., R. E. BHM
28	John H. Westover	Lots 6 and 7, SE¼ SW¼ Sec. 6; E½ NW¼, SW¼ NE¼, and W½ SE¼ Sec. 7, T. 5 S., R. 8 E. BHM
29	George and Mary Goodnick	NE¼ NW¼ Sec. 22, T. 11 S., R. 9 E. BHM
30	Moses L. Holley	S½ Sec. 4 and N½ Sec. 5, T. 4 S., R. 8 E. BHM
31	Edward G. Henry	NW¼ NE¼ Sec. 10, T. 12 S., R. 4 E. BHM
32	Edgar B. Jones	SE¼ NE¼ Sec. 9, T. 12 S., R. 4 E. BHM
33	William A. Cole	Sec. 7, T. 12 S., R. 3 E. BHM
34	William Borst	NE¼ Sec. 10, T. 4 N., R. 17 E. BHM
35	William S. Bentley	SE¼ SE¼ Sec. 15, T. 3 S., R. 8 E. BHM
36	Mary J. Bentley	SW¼ SE¼ Sec. 14, T. 3 S., R. 8 E. BHM
37	Perry J. Moody	NW¼ SE¼ Sec. 12, T. 12 S., R. 6 E. BHM
38	Herman J. Moritz	SW¼ SE¼ Sec. 10, T. 11 S., R. 4 E. BHM
39	J. L. Robbins	NE¼ NW¼ Sec. 28, T. 1 N., R. 12 E. BHM
40	Louis Lindberg	Lot 1 of NW¼ Sec. 7, T. 6 S., R. 1 E. BHM
41	Harriet E. Champ	W½ NW¼ Sec. 14, NW¼ SW¼ Sec. 4, and NE¼ SE¼ Sec. 15, T. 9 N., R. 14 E. BHM
42	Oscar C. Amiss	SE¼ NW¼, SE¼ SE¼ Sec. 17, and SW¼ NE¼ Sec. 20, T. 5 S., R. 8 E. BHM
43	George W. Darrow	NE¼ NW¼ Sec. 19, T. 6 S., R. 1 E. BHM
44	Vina A. Darrow	NE¼ NW¼ Sec. 19, T. 6 S., R. 1 E. BHM
45	Joseph F. Deister	SW¼ NW¼ and NW¼ SW¼ Sec. 5, T. 10 S., R. 1 E. BHM
46	Fred Kellermann	NE¼ NW¼ Sec. 14, and SW¼ NW¼ Sec. 13, T. 10 S., R. 3 E. BHM
47	Gust W. Werner	SW¼ NE¼ and NW¼ NE¼ Sec. 17, T. 10 S., R. 3 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Number	Name of Appropriator	Location of Dam
48	Hila C. Wallace	SE¼ SW¼, SW¼ SW¼ Sec. 12; NW¼ NW¼ Sec. 13; NE¼ NE¼ and SE¼ NE¼ Sec. 14, T. 12 S., R. 1 E. BHM
49	J. L. Larson	NW¼ NW¼ Sec. 35, T. 6 S., R. 1 E. BHM
50	Nellie B. Godfrey	NW¼ NW¼ Sec. 3, T. 1 S., R. 14 E. BHM
52	Mildred F. Miller	NW¼ NE¼ Sec. 34, T. 6 S., R. 7 E. BHM
53	Michael Nelson	SW¼ SW¼ Sec. 9, T. 6 S., R. 8 E. BHM
54	Alexander L. Webb	SE¼ SE¼ Sec. 23, T. 6 N., R. 17 E. BHM
55	Charles Heppner	SE¼ SE¼ Sec. 5, T. 10 S., R. 5 E. BHM
56	Laura Newton	NW¼ NE¼ Sec. 12, T. 5 N., R. 15 E. BHM
57	Henry A. Brewer	SW¼ NE¼ Sec. 14, T. 7 N., R. 16 E. BHM
58	Laura M. Newcombe	NW¼ SE¼ Sec. 1, T. 5 N., R. 15 E. BHM
59	Hattie Wallis	NE¼ NE¼ Sec. 24, T. 6 N., R. 16 E. BHM
60	Lawrence R. Wilson	SE¼ NW¼ Sec. 28, T. 5 N., R. 17 E. BHM
61	John Newcombe	NW¼ SW¼ Sec. 21, T. 6 N., R. 16 E. BHM
62	John W. Bean	NE¼ SE¼ Sec. 5, T. 1 N., R. 12 E. BHM
63	Wilson and Ray Burns	NE¼ SW¼ Sec. 17, T. 3 S., R. 17 E. BHM
64	Emma Bigelow	NW¼ SW¼ Sec. 13, T. 1 S., R. 10 E. BHM
65	George Alkire	NE¼ NW¼ Sec. 13, T. 7 S., R. 6 E. BHM
66	Centennial A. Hart	NW¼ NW¼ Sec. 35, T. 1 S., R. 16 E. BHM
67	Richard F. and Rosa J. Hart and George W. Wilson	SW¼ NW¼ Sec. 4, T. 2 S., R. 16 E. BHM
68	John H. and Mary E. Hart and Mabel Carpenter	SE¼ NW¼, NE¼ NW¼ Sec. 10, and NW¼ NW¼ Sec. 9, T. 2 S., R. 16 E. BHM
69	Cleva H. Hummel	SW¼ Sec. 1, and NW¼ Sec. 14, T. 7 S., R. 7 E. BHM
70	Elisha A. Palin	SW¼ SW¼ Sec. 15, T. 6 N., R. 16 E. BHM
71	Elmer Hawks	NW¼ NE¼ Sec. 11, T. 5 N., R. 16 E. BHM
72	James W. Hicks	SE¼ SW¼ Sec. 22, T. 6 N., R. 16 E. BHM
73	August H. Schneider	SW¼ SW¼ Sec. 33, T. 5 S., R. 8 E. BHM
74	Isam J. M. Brown	NW¼ SW¼ Sec. 11, T. 4 S., R. 15 E. BHM
75	Edward Wilsey	NW¼ SE¼ Sec. 1, T. 5 N., R. 16 E. BHM
76	John A. Germiquet	SE¼ NW¼ Sec. 18, T. 12 S., R. 5 E. BHM
77	Henry S. Snyder	SW¼ NE¼ and SW¼ SE¼ Sec. 17, T. 7 S., R. 3 E. BHM
78	Adolph Ohlson	SE¼ NW¼ Sec. 20, T. 11 S., R. 4 E. BHM
79	Edward F. Feezer	NW¼ Sec. 7, T. 109 N., R. 78 W.
80	James H. Atkinson and Charles A. Wright	SW¼ SW¼ Sec. 1, T. 11 S., R. 3 E. BHM
81	Roy Alcorn	NW¼ SW¼ Sec. 35, T. 11 S., R. 3 E. BHM
82	G. M. Cleveland	N½ SW¼ Sec. 29, T. 7 S., R. 5 E. BHM
83	James H. Bell	SW¼ NW¼ Sec. 27, T. 10 S., R. 4 E. BHM NW¼ SW¼ Sec. 27, T. 10 S., R. 4 E. BHM
84	Theodore Seiger	Lot 3, Sec. 1, T. 7 S., R. 8 E. BHM
85	Walter I. Hey	SE¼ NE¼ Sec. 34, T. 11 S., R. 2 E. BHM
86	Libbie Dryer	Sec. 13, T. 12 S., R. 1 E. BHM
87	James E. Hixson	Sec. 14, T. 12 S., R. 1 E. BHM
88	Oluf Johnson	SW¼ SW¼ Sec. 12, T. 3 S., R. 11 E. BHM
89	Caroline A. and David E. Gemmell	NW¼ NW¼ Sec. 27, T. 11 S., R. 2 E. BHM
90	Caroline A. Gemmell	NW¼ NE¼ Sec. 27, T. 11 S., R. 2 E. BHM
91	Willis L. Flewellin	NW¼ SW¼ Sec. 20, T. 6 S., R. 8 E. BHM
92	Hot Springs Irrigation and Live Stock Company	NW¼ NW¼ Sec. 6, T. 9 S., R. 6 E. BHM
93	Charlie Palmgren	Sec. 13, T. 7 S., R. 6 E. BHM
94	Charlie Palmgren	Sec. 13, T. 7 S., R. 6 E. BHM
95	Jep Christ Christensen	SW¼ SW¼ Sec. 6, T. 11 S., R. 4 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Number	Name of Appropriator	Location of Dam
96	John McLeod	NE¼ SW¼ Sec. 12, T. 5 N., R. 16 E. BHM
97	Marion Bennett	SE¼ SW¼ Sec. 15, T. 5 N., R. 17 E. BHM
99	Hot Springs Irrigation and Live Stock Company	SW¼ SW¼ Sec. 31, T. 8 S., R. 6 E. BHM
100	Hot Springs Irrigation and Live Stock Company	NW¼ NW¼ Sec. 6, T. 9 S., R. 6 E. BHM
101	Louis A. Duerson	NE¼ SW¼ and SE¼ SW¼ Sec. 32, T. 9 S., R. 4 E. BHM
102	Joseph H. Meiners	SE¼ NE¼ Sec. 28, T. 1 S., R. 14 E. BHM
103	Roxana B. and Morse Griffis	SE¼ NE¼ Sec. 23, T. 7 S., R. 1 E. BHM
104	Guy Davis	SE¼ NE¼ Sec. 11, T. 6 N., R. 17 E. BHM
105	William H. Reed	SE¼ SE¼ Sec. 5, T. 1 N., R. 14 E. BHM
106	William H. Reed	SE¼ SW¼ Sec. 9, T. 1 N., R. 14 E. BHM
107	David P. Thomas	Lot 6, Sec. 9, T. 1 N., R. 14 E. BHM
108	Colin Monroe	SW¼ SW¼ Sec. 13, T. 3 S., R. 8 E. BHM
109	Ethel M. Marshall	W½ NW¼ Sec. 24, T. 3 S., R. 8 E. BHM
110	Mrs. D. J. Walker	E½ SW¼ Sec. 27, T. 11 S., R. 4 E. BHM
112	William Pronk	NE¼ SE¼ Sec. 21, T. 2 N., R. 14 E. BHM
113	Charles L. Johnston	SE¼ NE¼ Sec. 4, T. 12 S., R. 5 E. BHM
114	Martilla Smith	Sec. 25, T. 5 S., R. 7 E. BHM
115	Alfred Jackson	NW¼ SE¼ Sec. 1, T. 12 S., R. 2 E. BHM
116	Mary Thomas	SW¼ NW¼ Sec. 11, T. 1 N., R. 14 E. BHM
117	George W. Joseph, Mary A. and Edwin LaBare	NW¼ NE¼ Sec. 21, T. 9 S., R. 1 E. BHM
118	Owen L. and Louis E. Vieno	NW¼ NE¼ Sec. 34, T. 10 S., R. 4 E. BHM
119	John J. Reisdorfer	NE¼ SE¼ Sec. 24, T. 10 S., R. 1 E. BHM
120	Anna Reisdorfer	SE¼ SW¼ Sec. 25, T. 10 S., R. 1 E. BHM
121	Peter, Marie and Barbara Reisdorfer	SE¼ NE¼ Sec. 25, T. 10 S., R. 1 E. BHM
122	Michael J. Knapp	NW¼ SE¼, NW¼ SE¼ Sec. 28, and NW¼ NE¼ Sec. 33, T. 11 S., R. 2 E. BHM
123	John J. Fitzpatrick	NW¼ SW¼ Sec. 28, T. 11 S., R. 2 E. BHM
124	Bessie M. Kime	NE¼ SE¼ and SE¼ NE¼ Sec. 22, T. 10 S., R. 3 E. BHM
125	Lou W. Fairchild	SE¼ SE¼ Sec. 18, T. 10 S., R. 3 E. BHM
126	Marie Henry	SE¼ SW¼ Sec. 18, T. 12 S., R. 5 E. BHM
127	Margaret A. Henderson	NW¼ SE¼ Sec. 14, T. 10 S., R. 3 E. BHM
128	George Sweat	SE¼ SE¼ Sec. 32, T. 10 S., R. 4 E. BHM
129	James M. Reynolds	E½ SW¼ Sec. 33, T. 4 S., R. 10 E. BHM
130	James H. Bell	NE¼ NE¼ Sec. 32, T. 10 S., R. 4 E. BHM
131	Lou W. Fairchild	SW¼ SE¼ Sec. 18, T. 10 S., R. 3 E. BHM
132	Joe Roller	NW¼ SE¼ Sec. 8, T. 12 S., R. 3 E. BHM
133	Bertha Shyne	NE¼ NE¼ Sec. 19, T. 2 N., R. 14 E. BHM
134	Dan Shyne	NE¼ SW¼ Sec. 20, T. 2 N., R. 14 E. BHM
135	Lizzie J. Hand	Sec. 17, T. 8 S., R. 3 E. BHM
136	Margaret A. Henderson	NW¼ SW¼ Sec. 14, T. 10 S., R. 3 E. BHM
137	Margaret A. and Andrew M. Henderson	NW¼ NW¼ Sec. 22, T. 10 S., R. 3 E. BHM
138	James A. Ball	SW¼ NW¼ Sec. 29, T. 9 S., R. 4 E. BHM
139	M. J. Waldner and Anna Kieper	SW¼ NW¼, SE¼ NW¼, and NW¼ NE¼ Sec. 17, T. 9 S., R. 1 E. BHM
140	Martha M. Kenyon	SE¼ SW¼, and SE¼ SE¼ Sec. 1, T. 12 S., R. 3 E. BHM
141	Henry C. Strohecker	SW¼ NW¼, and NW¼ SW¼ Sec. 34, T. 9 S., R. 8 E. BHM
142	Alice H. Barton and Lee R. Parkin	NE¼ SE¼ Sec. 20; SE¼ SW¼ Sec. 21; NE¼ NE¼ Sec. 28, and NE¼ NW¼ Sec. 27, T. 10 S., R. 2 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

Number	Name of Appropriator	Location of Dam
143	Lewis R. Midgard	NW¼ NE¼ Sec. 23, T. 11 S., R. 7 E. BHM
144	George W. and Richard L. Hawley	NW¼ SW¼ Sec. 2, T. 12 S., R. 5 E. BHM
145	Hans Martin Olson	NE¼ SW¼ Sec. 5, T. 11 S., R. 3 E. BHM
146	William J. Linker	SW¼ SW¼ Sec. 14, T. 12 S., R. 4 E. BHM
147	Edward Roller	NW¼ NW¼ Sec. 8, T. 12 S., R. 3 E. BHM
148	Frank Walsh	SE¼ SE¼ Sec. 2, T. 6 S., R. 1 E. BHM
149	Frank Walsh	SW¼ SW¼ Sec. 1, T. 6 S., R. 1 E. BHM
150	Katherin Walsh	W½ NW¼ Sec. 11, T. 6 S., R. 1 E. BHM
151	William A. Garney	NW¼ SE¼ Sec. 32, T. 3 S., R. 8 E. BHM
152	Noble M. and Elizabeth G. Biddle	SE¼ NW¼ Sec. 30, T. 9 S,, R. 1 E. BHM
153	James A. and Anna Naughton	NW¼ NW¼ Sec. 32. T. 9 S., R. 1 E. BHM
154	John I. Howe	NW¼ SE¼ Sec. 2, T. 2 S., R. 17 E. BHM
155	Martin C. Howe	NW¼ SW¼ Sec. 1, T. 2 S., R. 17 E. BHM
156	Edward E. Voedisch	SW¼ NW¼ Sec. 5, T. 6 S., R. 1 E. BHM
157	Charles A. Howe	SE¼ SE¼ Sec. 1, T. 2 S., R. 17 E. BHM
158	Charles A. Howe	NE¼ SE¼ Sec. 1, T. 2 S., R. 17 E. BHM
159	Charles A. and Martin C. Howe	NW¼ SE¼ Sec. 1, and NE¼ SW¼ Sec. 1, T. 2 S., R. 17 E. BHM
160	Millard Thompson	NE¼ NW¼ Sec. 7, T. 7 S., R. 7 E. BHM
161	Ormando H. Scott	NE¼ SE¼ Sec. 17, T. 10 S., R. 3 E. BHM
162	Thomas H. Linahan	SE¼ SW¼ Sec. 17, T. 10 S., R. 3 E. BHM
163	Isabel S. Humphrey	SE¼ NW¼ Sec. 1, T. 1 N., R. 10 E. BHM
164	Lourena B. Raymond	SE¼ SW¼ Sec. 9, T. 1 S., R. 16 E. BHM
165	Henry B. Raymond	SE¼ NE¼ Sec. 33, T. 1 N., R. 16 E. BHM
166	Lois K. Pettegrew	NE¼ NW¼ Sec. 8, T. 12 S., R. 7 E. BHM
167	George L. and John C. Mohler	NW¼ SW¼ Sec. 36, T. 6 S., R. 9 E. BHM
168	Willis L. Flewellin	NE¼ NW¼ Sec. 20, T. 6 S., R. 8 E. BHM
169	Charles M. Grieves	SW¼ NE¼ Sec. 33, T. 6 S., R. 9 E. BHM
170	Orian L. and Emmett J. McKirahan	NE¼ NE¼ Sec. 7, T. 5 S., R. 6 E. BHM
171	Rebecca Smith	NW¼ SW¼ Sec. 10, T. 5 S., R. 8 E. BHM
172	Frank A. Postlewait	SW¼ NW¼ and SW¼ SW¼ Sec. 29, T. 6 N., R. 13 E. BHM
173	Alice M. Mosier	SE¼ NE¼ Sec. 8, T. 7 S., R. 8 E. BHM
174	Frederick Naumann	NW¼ NE¼ Sec. 21, T. 1 S., R. 14 E. BHM
175	Henry P. Myers	SW¼ SW¼ Sec. 32, T. 2 S., R. 12 E. BHM
176	Charles H. Macomber	N½ NE¼ Sec. 18, T. 11 S., R. 3 E. BHM
177	George and Kate Pomplun	SW¼ and NE¼ SW¼ Sec. 17, T. 11 S., R. 3 E. BHM
178	Worth M. Garnet	SW¼ NE¼ Sec. 1, T. 8 S., R. 8 E. BHM
179	Worth M. Garnet	Sec. 1, T. 8 S., R. 8 E. BHM
180	Walter A. Cook	NW¼ SE¼ Sec. 13, T. 10 S., R. 3 E. BHM
181	Arthur L. Cook	SE¼ NE¼ Sec. 6, T. 6 S., R. 1 E. BHM
182	Bert F. House	NW¼ NW¼ Sec. 9, T. 1 S., R. 16 E. BHM
183	Ernest J. Pettegrew	NW¼ SW¼ Sec. 6, T. 12 S., R. 7 E. BHM
184	Effie Pelter	NW¼ SW¼ Sec. 24, T. 3 S., R. 8 E. BHM
185	Effie Pelter	NW¼ SW¼ Sec. 24, T. 3 S., R. 8 E. BHM
186	Effie Pelter	NE¼ NW¼ Sec. 25, T. 3 S., R. 8 E. BHM
187	George Pelter	SW¼ NW¼ Sec. 25, T. 3 S., R. 8 E. BHM
188	Felix V. Perleth	NW¼ NW¼ Sec. 11, T. 12 S., R. 5 E. BHM
189	Ralph Cassity	SE¼ NW¼ Sec. 25, T. 7 S., R. 8 E. BHM
190	Ralph Cassity	NE¼ SW¼ Sec. 25, T. 7 S., R. 8 E. BHM
191	Ralph Cassity	NE¼ SW¼ Sec. 25, T. 7 S., R. 8 E. BHM
192	Dennis O'Connell	NW¼ SW¼ Sec. 19, T. 11 S., R. 4 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

No.	Name of Appropriator	Location of Dam
193	Susie Wheeler	SW¼ SW¼ Sec. 6, T. 10 S., R. 1 E. BHM
194	Frank E. Sharp	Lot 1, Sec. 1, T. 1 N., R. 11 E. BHM
195	Niels Laurits Larsen	SE¼ NE¼ Sec. 14, T. 12 S., R. 3 E. BHM
196	Theresa Konrath	NE¼ NE¼ Sec. 26, T. 10 S., R. 3 E. BHM
197	Mary J. Hawks	NE¼ SW¼ Sec. 6, T. 5 N., R. 17 E. BHM
198	Michael Nelson	SW¼ SW¼ Sec. 9, T. 6 S., R. 8 E. BHM
199	Maggie Madsen	SW¼ SE¼ and SE¼ SW¼ Sec. 14, T. 11 S., R. 4 E. BHM
200	Dan Shyne	SW¼ NW¼ Sec. 20, T. 2 N., R. 14 E. BHM
201	Dan Shyne	NE¼ SW¼ Sec. 20, T. 2 N., R. 14 E. BHM
202	Bertha Shyne	NE¼ NE¼ Sec. 19, T. 2 N., R. 14 E. BHM
203	Bertha Shyne	NW¼ NW¼ Sec. 20, T. 2 N., R. 14 E. BHM
204	William Shorten	NE¼ NE¼ Sec. 10, T. 8 S., R. 1 E. BHM
205	William Shorten	NE¼ NW¼ Sec. 10, T. 8 S., R. 1 E. BHM
206	Andrew Hanson	NW¼ NW¼ Sec. 2, T. 1 S., R. 17 E. BHM
207	Andrew Hanson	NE¼ NW¼ Sec. 2, T. 1 S., R. 17 E. BHM
208	Harry H. Burman	NE¼ SW¼ Sec. 8, T. 11 S., R. 3 E. BHM
209	William G. Trotter	SW¼ NW¼ Sec. 19, T. 10 S., R. 3 E. BHM
210	Anna Belle Gorsuch	NW¼ SW¼ Sec. 10, T. 4 S., R. 7 E. BHM
211	Anna Belle Gorsuch	NW¼ NE¼ Sec. 15, T. 4 S., R. 7 E. BHM
212	William T. and Anna Belle Gorsuch	NW¼ SE¼ Sec. 9, T. 4 S., R. 7 E. BHM
213	Arthur B. Blodgett	SW¼ SE¼ Sec. 14, T. 3 S., R. 7 E. BHM
214	Arthur B. Blodgett	SE¼ Sec. 14, T. 3 S., R. 7 E. BHM
215	Arthur B. Blodgett	SE¼ Sec. 14, T. 3 S., R. 7 E. BHM
216	Arthur L. Cook	SW¼ SW¼ Sec. 5, T. 6 S., R. 1 E. BHM
217	Arthur L. Cook	NW¼ SW¼ Sec. 6, T. 6 S., R. 1 E. BHM
218	Clarence K. Calland	SE¼ NW¼ Sec. 22, T. 10 S., R. 2 E. BHM
219	John W. Horner	SW¼ SE¼ Sec. 15, T. 10 S., R. 2 E. BHM
220	Cora B. Morris	SE¼ NW¼ Sec. 34, T. 4 S., R. 9 E. BHM
221	Richard S. Morris	NW¼ SW¼ Sec. 34, T. 4 S., R. 9 E. BHM
222	Richard S. Morris	NE¼ SE¼ Sec. 34, T. 4 S., R. 9 E. BHM
223	Richard S. Morris	NW¼ SE¼ Sec. 34, T. 4 S., R. 9 E. BHM
224	Theodore Dybing	NW¼ NE¼ Sec. 22, T. 2 S., R. 16 E. BHM
225	Theodore Dybing	SE¼ NW¼ Sec. 22, T. 2 S., R. 16 E. BHM
226	Ida F. Skipton	NW¼ NW¼ Sec. 16, T. 3 S., R. 12 E. BHM
227	Jessie Hewitt	NW¼ NW¼ Sec. 3, T. 11 S., R. 1 E. BHM; and SW¼ SW¼, NW¼ SW¼ Sec. 34, T. 10 S., R. 1 E. BHM
228	F. C. Burds and H. L. Wheeler	SE¼ NE¼ Sec. 13, T. 10 S., R. 1. E. BHM
229	Luther E. Cleveland	SW¼ SE¼, SE¼ SW¼ Sec. 8, T. 8 S., R. 5 E. BHM
230	William and Caroline Skene	NE¼ NW¼ Sec. 35, T. 9 S., R. 2 E. BHM
231	Carrie Crawford	NE¼ SE¼ Sec. 30, T. 2 N., R. 14 E. BHM
232	Sarah Jane Jones	SW¼ SW¼ Sec. 16, T. 2 N., R. 12 E. BHM
233	Sarah Jane Jones	NW¼ NW¼ Sec. 21, T. 2 N., R. 12 E. BHM
234	George D. Bennett	NW¼ SW¼ Sec. 25, T. 4 N., R. 16 E. BHM
235	Theresa McDonald	SW¼ SE¼ Sec. 23; NE¼ NE¼, SE¼ NE¼, NW¼ SW¼ Sec. 26, T. 4 N., R. 17 E. BHM
236	Evan T. McDonald	SW¼ NE¼, NW¼ SE¼ Sec. 23, T. 4 N., R. 17 E. BHM
237	Andrew M. Henderson	SE¼ NW¼ Sec. 22, T. 10 S., R. 3 E. BHM
238	French N. McCurtain	SW¼ NW¼ Sec. 35, T. 9 S., R. 4 E. BHM
239	French N. McCurtain	NE¼ SE¼ Sec. 34, T. 9 S., R. 4 E. HBM
240	French N. McCurtain	NW¼ NW¼ Sec. 35, T. 9 S., R. 4 E. BHM
241	Frank Heppner	SE¼ SE¼ Sec. 35, T. 10 S., R. 4 E. BHM
242	Eva L. Williams	NE¼ SE¼ Sec. 31, T. 11 S., R. 3 E. BHM
243	Albert C. Soske	SW¼ NW¼ Sec. 11, T. 10 S., R. 2 E. BHM
244	Fred W. Gerkin	NW¼ SE¼, SW¼ NE¼, NE¼ SE¼ Sec. 33, T. 2 S., R. 16 E. BHM
245	Henry Herley	NE¼ NE¼ Sec. 15, T. 4 S., R. 17 E. BHM
246	Henry Herley	NE¼ NE¼ Sec. 15, T. 4 S., R. 17 E. BHM

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LIST OF FILINGS ON DRY DRAWS—Continued

No.	Name of Appropriator	Location of Dam
247	Lafayette O'Neill	NW¼ SW¼ Sec. 2, T. 3 N., R. 16 E. BHM
248	Lafayette O'Neill	NE¼ SW¼ Sec. 2, T. 3 N., R. 16 E. BHM
249	Lafayette O'Neill	NE¼ SE¼ Sec. 3, T. 3 N., R. 16 E. BHM
250	Rachel O'Neill	SW¼ NW¼ Sec. 3, T. 3 N., R. 16 E. BHM
251	Ralph Wilsey	SE¼ SW¼ Sec. 7, T. 5 N., R. 17 E. BHM
252	Thomas F. Linahan	SE¼ NE¼ Sec. 7, T. 10 S., R. 3 E. BHM
253	William Longman	SE¼ SW¼ Sec. 15, T. 9 S., R. 1 E. BHM
254	Jacob Baumann	SE¼ NW¼ Sec. 13, T. 3 S., R. 16 E. BHM

Under the requirements of the United States government, applicants making final proof on desert claims in this state are required to furnish a certificate from the State Engineer regarding their water rights under the laws of the state of South Dakota. Some of these certificates required have been to the effect that the applicants were entitled to a water right under the laws of the state. In such cases the State Engineer has required that the applicant furnish him with due proof of the completion of his irrigation works and of the application of the water to beneficial use, before a certificate for the land office would be issued. In other cases all that has been required is a certificate to the effect that the location certificates of the applicant is on file in this office. The following list comprises the certificates, as above designated, which have been issued from this office:

CERTIFICATES FOR U. S. LAND OFFICE

Number	Division No.	Name of Appropriator	Date of Issuance
73	2	August H. Schneider	October 9, 1907
9	1	John A. Scotney	January 5, 1908
5	2	Ada McDermand	January 10, 1908
168	1	George A. Williams	January 29, 1908
165	1	Mrs. Nellie S. Smith	January 29, 1908
167	1	Miss Sarah M. Smith	January 29, 1908
166	1	Mrs. Nellie S. Smith	January 29, 1908
28	1	Joe German	July 2, 1908
35	1	Amanda E. Sandusky	July 2, 1908
34	1	Osmund T. Sevareid	July 14, 1908
44	1	David R. Murphy	September 18, 1908
36	1	Charles J. Buell	September 18, 1908
40	1	Isaac E. Shoun	September 18, 1908
45	1	LeRoy Leach	September 19, 1908
43	1	Elizabeth Silfven	October 1, 1908
52	1	Mabel S. Horlocker	October 19, 1908
42	1	Harry G. Duncan	December 18, 1908
75	2	Edward Wilsey	December 18, 1908
165	1	Mrs. Nellie S. Smith	March 23, 1909
167	1	Miss Sarah M. Smith	March 23, 1909
166	1	Mrs. Nellie S. Smith	March 23, 1909
30	2	Moses L. Holley	April 1, 1909
89	1	Cassius E. Gorsuch	April 22, 1909

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CERTIFICATES FOR U. S. LAND OFFICE—Continued

Number	Division No.	Name of Appropriator	Date of Issuance
50	1	Maggie Hanks	April 22, 1909
109	1	John Jordan	April 22, 1909
98	1	James Tucker	April 22, 1909
21	1	Eugene F. Brown	April 27, 1909
102	2	Joseph H. Meiners	May 1, 1909
116	1	Joseph W. Burton, Jr.	May 6, 1909
119	1	Knud P. Christensen	May 12, 1909
120	1	Knud P. Christensen	May 12, 1909
138	1	Frederick Richter	August 2, 1909
112	1	Ursula B. Harnsberger	August 31, 1909
167	2	George L. and J. C. Mohler	August 31, 1909
166	2	Lois K. Pettegrew	August 31, 1909
113	1	Winifred A. Fish	September 3, 1909
159	1	Charles P. McPherson	September 15, 1909
160	1	Charles P. McPherson	September 15, 1909
161	1	Clara M. McPherson	September 15, 1909
162	1	Clara M. McPherson	September 15, 1909
163	1	Clara M. McPherson	September 15, 1909
170	1	John T. Moore	October 5, 1909
171	1	John T. Moore	October 5, 1909
172	1	John T. Moore	October 5, 1909
174	1	Mrs. Jennie Ashley	October 5, 1909
173	1	John T. Moore	October 5, 1909
130	1	John Zirchling	October 26, 1909
59	1	Blanch B. Hall	October 28, 1909
104	2	Guy Davis	November 1, 1909
55	1	Mary Harrington	November 5, 1909
56	1	Mary Harrington	November 5, 1909
199	1	Bertha Trummer	December 8, 1909
200	1	Jessie F. Devers	December 23, 1909
157	2	Charles A. Howe	January 5, 1910
158	2	Charles A. Howe	January 5, 1910
154	2	John I. Howe	January 5, 1910
68	2	John H. and Mary E. Hart and Mabel Carpenter	January 11, 1910
66	2	Centennial A. Hart	January 20, 1910
67	2	Richard F. and Rosa J. Hart and George W. Wilson	January 25, 1910
197	2	Mary J. Hawks	January 31, 1910
96	2	John McLeod	February 3, 1910
128	1	Co Shirley	February 5, 1910
203	1	Annie Richards	February 7, 1910
210	1	Christ Jost	February 7, 1910
155	2	Martin C. Howe	February 10, 1910
206	2	Andrew Hanson	February 14, 1910
134	2	Dan Shyne	March 25, 1910
94	1	James R. Babcock	April 5, 1910
93	1	William Babcock	April 5, 1910
53	1	A. Garfield Shoun	April 6, 1910
220	1	Alanson Giles	April 9, 1910
218	1	Mina Giles	April 9, 1910
219	1	Mina Giles	April 9, 1910
63	1	Alfred D. Reeder	May 11, 1910
63	1	Maud E. Reder	May 11, 1910
250	1	George W. Devers	June 21, 1910
244	2	Fred W. Gerkin	June 21, 1910
232	2	Sarah Jane Jones	July 5, 1910
233	2	Sarah Jane Jones	July 5, 1910
164	2	Lourena B. Raymond	July 11, 1910
165	2	Henry B. Raymond	July 11, 1910

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CERTIFICATES FOR U. S. LAND OFFICE—Continued

Number	Division No.	Name of Appropriator	Date of Issuance
194	2	Frank E. Sharp	July 14, 1910
272	1	Andrew Peterson and August Tokola	July 18, 1910
273	1	Andrew Peterson and August Tokola	July 18, 1910
254	2	Jacob Baumann	August 11, 1910

IRRIGATION

Progress and Development

South Dakota, although not classed strictly as an irrigation state, has an irrigated area of considerable size and a much larger area that can eventually be brought under irrigation. The situation in this state is peculiar because of the great variation in local requirements in different parts of the state. In the eastern portion, there is great need of drainage for the protection and reclamation of agricultural lands, and much of the time of the State Engineer is taken up looking after drainage matters east of the Missouri river. In western South Dakota, especially in the region adjacent to the Black Hills, irrigation is extensively practiced. In that section, however, the practice of irrigation is not general, since for a number of years past, good crops have been raised without the artificial application of water. It may be truthfully said that the practice of irrigation in South Dakota is still in the formative period. A few of the valleys in the Black Hills region have offered fine opportunities for irrigation development and these have been made garden spots by irrigators. In this section of the state irrigation was first practiced on a commercial scale and it is now carried on extensively therein. Many prosperous irrigated farms and fruit ranches abound and the value of water for irrigation is fully appreciated. In the adjacent region, especially along the larger creeks, much land has also been brought under irrigation. This is especially true of Rapid Creek Valley, which is irrigated through a considerable part of its extent. Other creeks have considerable bodies of irrigated land in their valleys, but there are still remaining large areas susceptible of irrigation.

There are many inviting opportunities in western South Dakota for the development of large irrigation projects and the reclamation of many thousand acres of splendid land. The demand for homesteads and the steady influx of new settlers have caused a radical departure from old methods of land utilization, and the country that was formerly considered barren and worthless for agricultural purposes is now being cultivated with marked success. Hundreds of thousands of acres of land formerly given over to grazing are now under cultivation and productive crops are being raised thereon. The new settlers in the state, as a rule, are

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awake to the possibilities of land reclamation by irrigation and are eager to take advantage of improved methods where same are practicable. Being new people in a new country, they are willing to be shown and have no deep-rooted prejudices against modern practices to overcome. In most cases they come to make homes on the land and wish to follow the best practices for making the lands productive.

In round numbers, there are about 125,000 acres of land now under irrigation in South Dakota. This area will soon be augumented by many thousand acres upon the completion of the Belle Fourche project by the United States reclamation service. Other private projects will bring the acreage up to a grand total of about 200,000 acres of irrigated land.

This area, large as it is, represents only a small part of the irrigable area of the state, so it will be readily seen that there is plenty of room for irrigation development in South Dakota.

The principal method of irrigation is from running streams. These are tapped in the usual fashion, suitable headgates being constructed, and the water is conveyed over the land that is to be irrigated by means of ditches and flumes. In some valleys a great deal more water is used, measured in second feet, than a measurement of the stream will show at any point along the channel. This apparent discrepancy is easily accounted for when return seepage water into the channel is considered. A large percentage of the water that is not lost by evaporation finds its way back to the stream and is used again at some point lower down the valley.

In most cases the irrigation water, even from the larger streams, is taken direct from the channel without any attempt at storage or the formation of a forebay to add regularity to the flow of water through the diversion works. This method will doubtless be changed and improved as irrigation methods advance and the necessity of conservation becomes more apparent. Irrigation will be applied to greater areas and the water supply will of necessity be made to go further and perform greater duty than under present conditions.

Irrigation Enterprises

The seasonal distribution of the rainfall, the planting of seeds adapted to local conditions of soil and climate, and improved methods of cultivation, have effected a satisfactory condition of agriculture in eastern South Dakota, which admits of the production of excellent crops in ordinary years without artificial application of water to the land. Even should there be a recurrence of dry periods in the future, it is reasonable to assume that on account of the increasing use of scientific methods of soil culture, there will be no such disastrous results therefrom as occurred during similar periods in the past.

In the western part of the state there are many irrigation systems in operation; some of these are of considerable importance. The region just west of the Missouri river, comprising the Indian reservations

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which have not yet been opened for settlement, embraces a large area that, while not now available, will eventually form an important factor in the agricultural situation. The remaining adjacent territory is still largely undeveloped, although rapidly becoming settled, especially along the new railway lines extending westward through the state. In this newly settled region there have been no important irrigation works constructed, the attention of the settlers having been directed in this line mainly to the construction of small reservoirs for storing storm water. These reservoirs are used principally as a source of water supply for stock, although in many cases small areas are irrigated from them for raising alfalfa or vegetables and other products for local use.

Private Irrigation Systems

The largest and most important irrigation enterprises in the state are situated in the region adjacent to the Black Hills, comprising the counties of Butte, Meade, Lawrence, Pennington, Custer and Fall River. Some of these systems are of considerable magnitude and most of them have been in operation for a number of years. They were practically all constructed as private or corporate projects—that is, without public assistance. A brief description of the principal irrigation systems of this character will be given.

Redwater Canal

This ditch is the property of the Redwater Land and Canal company, a corporation which operates the enterprise on a commercial basis, furnishing water to farmers for irrigating. The headgate is situated about five miles above the mouth of Redwater river, from which stream the water is taken. The total length of the canal is 42 miles, but only 30 miles is in use, the lower 12 miles having been abandoned. The company claims the right to appropriate 100 cubic feet per second of water from Redwater river, but it is evident that this amount is not used at the present time. The U. S. Geological Survey has published a tabular statement of the monthly discharge of this canal at Minnesela, a point near its head, during the period from May 27 to October 31, 1906. From this table it is seen that the mean monthly discharge ranged from 10.5 cubic feet per second in June to 70.5 cubic feet per second in July. The area irrigated is stated to be about 5,000 acres, and under the state water law, which allows an appropriation of one cubic foot per second for each 70 acres, a flow of 71.4 cubic feet per second could be required, which corresponds closely to the maximum measured flow. With careful husbandry the duty of water in this locality can be increased considerably, and it is probable that the canal could easily be made to irrigate from 8,000 to 10,000 acres.

The price charged to farmers for the water is $1.50 per miner's inch per year, the miner's inch being, under the old water law, equivalent to one-fortieth of a cubic foot per second, the same as the Montana standard. For small garden patches the company charges $1.50 per year for

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each acre irrigated. Water is supplied to about sixty customers, the flow being regulated and measured by weirs at the lateral headgates.

The cost of irrigating, in addition to the water rent, is about 50 cents per acre. Since the larger tracts use less than a miner's inch of water per acre, a fair estimate of the total cost per acre would be $1.50. The cost of keeping up this canal is about $600 per year, which is paid by the company. Each water user maintains his own laterals.

Edgemont Canal

This canal was constructed in the early nineties by the Edgemont Company for the purpose of irrigating a tract of about 4,000 acres in the Cheyenne River Valley. A short while after its completion the company suspended operations, and the canal was abandoned. There has been considerable litigation about possession and ownership, and for some years very little irrigation was done. The point of diversion is on the Cheyenne river a short distance below the mouth of Beaver creek, and the canal extends down the valley on the south side of the river a distance of 14 miles to the town of Edgemont, in Fall River county. The land under the ditch is for the most part flat, with a gentle slope toward the river. The soil is fertile, and the conditions are excellent for successful irrigation. The canal has been repaired recently and is now in active use. Arrangements have been made to irrigate 2,000 acres of land. The stated capacity is 40 to 50 cubic feet per second, so there will be ample facilities for supplying water to as much as 3,000 acres when this canal is in full operation. There are no figures available to show the cost of irrigating land under this canal. The original cost of the canal is stated to have been $88,000, but the present owners purchased the property for an amount very much smaller. Considerable money, however, has been expended in repairing the canal and placing it in first-class condition.

Cascade Ditch

This is one of the most successful private irrigation enterprises in the state. It was constructed originally by Herman Mahler for irrigating his own land, but the ditch has been enlarged and extended to supply the needs of the neighboring farmers until its full capacity has been reached. It is now the property of his successors, the Cheyenne Valley Ranch Company. The source of supply is a group of springs situated in Fall River county, about ten miles southwest of the town of Hot Springs. These unite and form Cascade creek, a tributary of the Cheyenne river. The point of diversion is about a mile below the springs, the water being taken out by simply turning the main flow of the creek into the ditch through a diversion channel. The upper portion of this ditch supplies water to eight farmers, including the present proprietors. About 900 acres of land are irrigated from this section, requiring a flow of 13 cubic feet per second of the total flow of 30 cubic feet per second. The remainder is distributed among the several adjacent farmers in proportion

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to their acreage of irrigable land. These irrigators are charged a uniform rate of $1.50 per acre per annum for each acre irrigated. The company keeps up the main ditch and the irrigators maintain their individual laterals. An extension of this ditch beyond the original terminal has been made by a company which owns a water right covering the remaining 17 cubic feet per second. This extension is 12 miles long and carries the ditch into the valley of the Cheyenne river below the mouth of Cascade creek. This company owns about 2,600 acres of fine land under the extension and intends to utilize their share of the water on this area as far as it will go.

Iowa and Hawthorne Ditches

These two ditches are typical of a large number of irrigation systems in use in Rapid Creek Valley. They are owned by the farmers who irrigate from them and are in that sense community ditches. The Iowa ditch is the highest irrigation ditch now being operated in Rapid Creek Valley. Its headgate is situated within the limits of Rapid City, above which point little irrigation is done at the present. The ditch is six miles long and has a capacity of 15 cubic feet per second. There are 1,023 acres of land under it, which is as much as can be taken care of under present conditions. The grade of this ditch is rather light, and, since Rapid creek has a rapid fall, an elevation considerably above the lower part of the valley is soon attained. This is advantageous in one way, since it permits the irrigation of a large area of irrigable land at some distance from the creek. It would be better, however, to have a heavier fall in order to create sufficient current to carry down the fine silt and other suspended matter in the water, instead of having it deposited in the channel, as is the case at present. It is asserted that the projectors of this ditch intended to extend it for a distance of about 30 miles below Rapid City, in order to take in a large body of fine land situated largely on the ridge between Rapid and Box Elder creeks. This ambitious project was found to be impracticable under existing conditions, the main difficulty being the lack of sufficient water. The Iowa ditch is junior in priority of right to appropriate water to a number of ditches lower down the valley, and during the irrigation season the water supply is subject to the needs of prior appropriators. It is claimed now that the ditch can easily be extended as originally designed, since a water supply can be obtained by means of storage reservoirs to be located at suitable places along the route and filled by the flood flow from Rapid creek. No surveys have been made to determine the feasibility of this proposition.

The Hawthorne ditch, including a proposed extension, is 8.5 miles long and has a stated capacity of about 30 cubic feet per second. The headgate is situated about 1.5 miles below Rapid City, the water being turned into the ditch by means of a diversion dam. There are 1,028 acres of irrigable land under the ditch, and the water supply is barely sufficient for this area, especially during the season when the other ditches along the stream are using water. This ditch is operated on the

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community plan, the stockholders being owners of the land under it. No figures are available showing the cost of irrigating land under this ditch, but it is thought that this will not exceed $1.50 per acre.

Small Ditches

There are a number of private irrigation works on various streams in the western part of the state, the greatest development being in the valleys of Spearfish and Rapid Creeks. In the former valley irrigation has been carried on systematically for a number of years and the products are largely fruits and vegetables. The same is true of Fall River Valley, especially the upper portion near the city of Hot Springs. Rapid Creek Valley, however, is given over mostly to hay, the holdings containing several hundred acres each.

There are a great many instances of partial irrigation, where storm water is collected in small storage reservoirs and used on the land as far as it will go. This method is used in localities where there are no running streams available for water supply. It furnishes only a partial supply of water for irrigation but is productive of good results in the way of crops.

The use of artesian water for irrigation has not been practiced to any extent in the western part of the state, but there is one instance where it promises to be effective, which will be cited. The Stearns farm in the southern part of Butte county contains altogether 320 acres of land. This farm has an artesian well which has force enough to operate a motor by means of which electricity is generated for lighting cattle barns and sheep pens, as well as the farm residence. In addition to this, practically all the household machinery is also furnished with electric current sufficient for operation. A second artesian well has recently been sunk on this farm which is said to have a flow sufficient, with proper care, to irrigate 160 acres of land. This is an unusually strong flow, and the success attained in obtaining wells on this farm indicates the possibility of using the same methods in reclaiming other lands in the vicinity.

The Belle Fourche Project

The United States Reclamation Service has been engaged for several years in constructing this great irrigation system, which is now nearing completion. The following information concerning this project was taken from the reports of the U. S. Reclamation Service.

The location is in Butte and Meade counties, occupying townships 6 to 10 north, ranges 3 to 8 east, Black Hills Meridian. The altitude is 2,600 to 3,000 feet. The Chicago and Northwestern railway is adjacent, the Chicago, Burlington and Quincy railway 14 miles southwest, and the Chicago, Milwaukee and St. Paul railway 50 miles southeast of the project.

The principal markets are Omaha, Sioux City, Chicago, Minneapolis, St. Paul, and mining towns in the Black Hills. The United States land

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office is in Rapid City. The irrigable area is located in townships 7 to 10 north, ranges 2 to 7 east, Black Hills Meridian. The extent east and west is about 40 miles, and north and south about 13 miles; average elevation, 2,800 feet. The character of the soil on the north side of the valley is clayey loam and on the south side sandy loam. The temperature ranges from 100 degrees to —30 degrees F. The average annual rainfall is 14 to 18 inches; the size of the farm units is 80 acres of irrigable land; the value of irrigated lands is $75 to $100 per acre; the principal products are alfalfa, grain, vegetables, hardy fruits, sugar beets, and native hay; the duty of water is two acre-feet per annum; the watershed is 4,300 square miles; the average rainfall in the mountains is 18 to 25 inches; the average annual discharge of the Belle Fourche river at the head of the inlet canal is 400,000 acre-feet; storage reservoir, 8,000 acres; capacity, 203,770 acre-feet. The storage dam is of earth with concrete revetment; length on top, 6,200 feet; maximum height, 115 feet. The diversion dam in the gravity section is of concrete; length, 400 feet; height, 23 feet. The main canals have a total length of 100 miles; width on bottom. 14 to 40 feet. The lateral canals have a total length of 125 miles; sublateral canals, 1,000 miles.

A reconnaissance survey of the Belle Fourche Valley was begun on July 8, 1903, with the view of providing for the irrigation of part of it with the waters of the Belle Fourche and Redwater rivers, which were going to waste each year. On May 10, 1904, the construction of the project was authorized by the Secretary of the Interior. On July 20, 1904, the Belle Fourche Valley Waterusers' Association was organized by the residents of the valley who owned private lands under the proposed system, the total area being represented by 100,000 shares of stock of a total value of $3,400,000.

Final surveys and plans were made during the summer of 1904, and on April 10, 1905, bids were opened at Denver, Colorado, for the diversion dam, the main feeder canal, and structures on the main feeder canal. Contracts were awarded on April 24 and 26, and construction work was started immediately and has been carried on continuously since that time. The project contemplates the reclamation of 100,000 acres, in the Belle Fourche Valley, beginning about two miles east of the town of Belle Fourche and extending east 40 miles. The valley lands on both sides of the river are included in the irrigable area. The main supply canal and diversion dam have been completed and the water turned in. The waters of the Belle Fourche river run through this canal and are to be stored in the Belle Fourche reservoir, which will hold sufficient water to irrigate completely all lands in the project except about 4,000 acres which are above the reservoir and will receive water from the river.

Two canals carry the water from the reservoir to the lands. One, the North canal, runs in a northerly and easterly direction and serves land in Indian, Horse, Dry, and Willow Creek Valleys. The other, the

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South canal, runs in a southerly and then easterly direction and irrigates lands in Owl Creek Valley and on the south side of the river in the vicinity of Vale and Empire.

The first section of the South canal has been completed, and during 1910 water has been furnished to about 12,000 acres of land under it and to 4,000 acres under the Inlet canal. The area that will receive water will be increased each year as the different canals are completed until the final completion in 1911.

Main Supply Canal—The inlet or main canal is 6.5 miles long and runs from the Belle Fourche river to the reservoir. It will be used chiefly to fill the reservoir, there being about 4,000 acres of irrigable land under it. The canal is 40 feet wide on the bottom and 70 feet wide at high-water line and carried 10 feet of water. The grade is one foot per mile and the capacity 1,635 cubic feet per second. The water enters the canal through a concrete regulator. At Crow creek, a half mile below the regulator, a wasteway and set of three sluice gates are located. At the lower end of the canal a concrete weir or overflow 180 feet long, with a concrete apron, has been constructed to drop water from canal to reservoir. Water will flow over the weir only two feet deep when the canal is running full. The structure is so arranged that the canal can be emptied through an opening at the lower end.

Diversion Dam and Regulator. The dam in the Belle Fourche river is used to raise the water in the river about eight feet and divert the flow to a depth of 10 feet into the canal. The dam consists of a concrete weir or overflow 400 feet long, founded on bed rock and connected on the south side with an earth wing dam 1,300 feet long, which is paved on the water slope, or upper side, with 18 inches of stone. The regulator at the head of the supply canal consists of seven openings, each five feet wide, the water being controlled by double gates operated by ball-bearing pedestals. There are also three gates of the same size through the dam, used as sluice gates, or to waste the water down the river if desired without forcing it over the weir. The above described works are completed and ready for use.

Belle Fourche Dam. This dam, which is being built across Owl creek, 12 miles northeast of the town of Belle Fourche, will, when completed, be one of the highest earthern dams in the United States. The water will be backed up Owl creek about 10 miles and a water area of 8,010 acres produced, having an available storage of 203,770 acre-feet. The dam is built of earth, watered and rolled in six-inch layers. The water slope will be protected by two feet of gravel on which a facing of eight inches of concrete will be placed. The outer slope will be seeded to grass to protect it from wash. There are two conduits through the dam, one at the head of the North canal and one at the head of the South canal. These are reinforced concrete structures, and the water is controlled by cast iron gates. The dam, when completed, will be 115

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feet high at the highest point and 6,200 feet long on top. An overflow wasteway capable of discharging 3,000 cubic feet per second is to be provided.

North Canal. This canal will be 45 miles long. The first section has been completed and is ready for use. The main structures on it will be the Indian creek and Horse creek pressure pipes. The first section of the canal is 32 feet wide on the bottom, carried seven feet of water, and has a capacity of 650 cubic feet per second.

South Canal. This canal will be 45 miles long. The first section has been completed and is ready for use. It is 18 feet wide on the bottom, carries water to a depth of 5.5 feet, and has a capacity of 320 cubic feet per second. The main structures to be built are two wasteways, the Belle Fourche, Anderson and Whitewood pressure pipes, and a tunnel 1,295 feet long. The total length of the siphons or pressure pipes is 4,600 feet. Work is in progress on these structures.

Laterals. The construction of the system of lateral ditches for about 25,000 acres, or one-fourth of the irrigable area, has been completed, and these will be ready for use when water is turned into the larger canals.

Irrigable Lands. The irrigable land under the project begins about two miles below the diversion of the Belle Fourche river and extends east for 40 miles, including, besides the valley of the Belle Fourche river, those of Indian, Owl, Horse, Antelope and Willow creeks on the north side, and Whitewood, Cottonwood and Nine Mile creeks on the south side. Fine crops are now raised in these valleys in years when the rainfall is sufficient, but crops can not be depended upon without irrigation.

Many of the farm units contain, besides 80 acres of irrigable land, 40 or 80 acres of high or rough land which can not be irrigated, but is valuable to the settler for grazing or in occasional years for dry crops. The open range extends to a great distance on all sides of the project and affords excellent summer feed for the herds of the settlers.

The total irrigable area is 100,000 acres, divided into more than 1,000 farms. The slope of the land ranges from very flat on Indian creek to rolling on Willow creek. The soil is all fertile and free from alkali and stone. The natural growth in its wild state is sagebrush, cactus, and wild-wheat grass. Wherever there is water a good growth of timber is found along the many creeks.

Town Site. A tract of land, 640 acres in area, has been reserved for a town site. This is located near the center of the project and it is thought it will be the center of a large farming community after the system is in operation. The land has been laid off into streets, blocks, etc., and the lots will be appraised and sold at public auction. It is expected that the proceeds of the sale will be available for municipal improvements, schoolhouses, parks, and streets. This town is called Newell; it

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is already a flourishing business center. Another new town called Nisland has been established on the project.

Grand River Project

In February, 1907, the United States government, through H. N. Savage, a supervising engineer of the Reclamation Service, appropriated the waters of the North Fork of Grand river, in Butte county, for irrigation purposes. The appropriation was made for the lands covered by the Grand river project, which is to be undertaken by the U. S. Reclamation Service. This project covers about 10,000 acres, of which about 7,000 acres are in North Dakota and 3,000 in South Dakota. It is proposed to form a water users' association, composed of settlers in both states. Some action will soon be taken in the matter. The land is productive and well adapted for irrigation.

Other Irrigation Projects

In addition to the Belle Fourche project and the proposed Grand River project, other irrigation projects in the state have been considered. Examinations or reconnaissances of these propositions have been made by engineers of the U. S. Reclamation Service. Preliminary reports have been published and these reports are given here. The officials of the Reclamation Service have not indicated that there is any probability of taking up any of the propositions considered, but it is thought that one or two of them might be carried out under the Carey Act, this act having been made applicable to South Dakota, by the legislature of 1909.

The following reports are taken mainly from the Third Annual Report of the Reclamation Service.

Rapid Creek Reconnaissance

There is probably some water available for storage from Rapid creek, if the amount needed for lands now in cultivation below Rapid City is used economically and none is wasted.

The best land available for reclamation is on the north slope of Box Elder creek and is mostly in private ownership. To reclaim this area all the spring and flood flow of Rapid and Box Elder creeks must be stored. The only feasible site is on Box Elder creek near the town of Blackhawk, to reach which a diversion of Rapid creek must be made about six miles above Rapid City. This diversion would interfere with two plants at Rapid City that use the water for power purposes, unless arrangements for local storage at the point of diversion could be made.

There is probably sufficient water available to reclaim 20,000 acres if the above complication were removed. It is thought that the storage previously referred to, along the proposed extension of the Iowa ditch, might be sufficient to reclaim about 30,000 acres lower down the valley.

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Little Missouri River Reconnaissance

During the summer of 1904, a possible storage system by which the flood waters of the Little Missouri river could be utilized for irrigation, was surveyed near Alzada, Montana.

Gaging stations were established on the river near the reservoir site and at Camp Crook, South Dakota, near the irrigable land, and a careful record of the available flow was kept daily. The land is mostly owned by the government and possibly 40,000 acres may be reclaimed as railroad facilities come within reach of this territory.

Cheyenne River Reconnaissance

A reconnaissance was made in the summer of 1904 of the upper watershed of the Cheyenne river for possible reservoir sites. None were found on the main river that could be constructed at a cost permissible by the amount of land to be reclaimed. Possible sites were located at Hat creek and Beaver creek, but as nothing was known of the flow of these creeks gaging stations were established, so that a careful study of the water supply of each could be made.

The Cheyenne river has a drainage area of about 7,350 square miles above Edgemont, South Dakota. The stream is sandy and dry for a large part of the summer, although subject to floods in the spring time from melting snow and through the summer from sudden storms.

About 40,000 acres of first class land are situated along this river but, even if the water supply should be satisfactory, the cost of reclamation would be high on account of the irrigable tracts being scattered, requiring long and expensive canals. The land is mostly in private ownership.

Irrigable Areas

Numerous estimates have been made concerning the extent of irrigable land in South Dakota. This office has devoted considerable time and attention to the collection of trustworthy data on this subject. From information obtained from various sources and from the records of this office the following statement has been compiled, showing the areas that are now under irrigation, including those that will be supplied with water January 1, 1911; also areas that will be reclaimed when present undertakings are completed.

Areas Supplied With Water June 30, 1910

Redwater canal	5,000 acres
Spearfish Valley	5,335 acres
Little Missouri water district	213 acres
Belle Fourche water district	3,242 acres
Elk Creek water district	7,075 acres
Rapid Creek water district	15,278 acres
Battle Creek water district	149 acres
Fall River water district	3,900 acres

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South Cheyenne water district	2,709 acres
Belle Fourche project	16,000 acres
Reservoir filings (estimated)	14,000 acres
Total	72,901 acres

Additional Areas to Be Reclaimed Under Present Undertakings

Little Missouri water district	1,117 acres
Grand River water district	1,640 acres
Moreau River water district	2,648 acres
Belle Fourche water district	4,401 acres
Elk Creek water district	2,626 acres
Rapid Creek water district	3,254 acres
Battle Creek water district	6,450 acres
Fall River water district	2,297 acres
South Cheyenne water district	3,740 acres
Belle Fourche project	84,000 acres
Reservoir filings (estimated)	30,000 acres
Total	142,173 acres
Add area to be irrigated June 30, 1910	72,901 acres
Grand total	215,074 acres

Reservoir Irrigation

In that portion of South Dakota situated between the Black Hills and the Missouri river there are many thousands of new settlers who have taken claims under the homestead laws. There are comparatively few running streams in this region and, in order to secure local water supply hundreds of storage dams have been constructed for the purpose of collecting water when the snows melt in the spring and the summer rains fall.

Most of these dams have been constructed on so-called dry draws, under the provisions of Section 31 of the State Water Code. Unfortunately the construction of these dams has not been placed under the supervision of the State Engineer and it is safe to say that most of them are improperly built. It is hoped that the Water Code will be amended by the legislature so as to require that all dams built in the state shall conform to safe requirements in design and construction.

Such dams are very useful in furnishing supplies of water for irrigation and domestic use. They are also of much value for the watering of live stock during the dry season of the year. While the area of land that can be irrigated from a reservoir of this character is necessarily small, still many gardens and fields of alfalfa are kept green and flourishing by storm water reservoirs.

A typical instance of irrigation by such methods is afforded in the Barber reservoirs, built several years ago on a homestead situated about five miles from the town of Belle Fourche. These reservoirs, while

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rather crudely constructed, have done excellent service in storing and furnishing water for growing crops upon semi-arid land.

In the design and construction of reservoirs of this character it is always advisable to obtain the services of a competent engineer. A few general rules relating to such work will be given here.

Selection of Site

In the rolling prairies there are many reservoir sites available, but it often requires a careful search to select a suitable one. In most cases the reservoirs will be built on so-called dry streams in which water runs only during and just following storms. Usually the reservoir is formed by means of a dam across the bed of the stream which furnishes the water supply, although it would generally be preferable to receive the water supply through a supply ditch from an independent catchment area. Advantage should be taken of natural topographical features that will decrease the length and height of the dam and increase the capacity of the impounding basin. If there be choice in position relative to the prevailing wind, the one where it blows waves away from the dam should always be selected. As a rule, however, there is little choice in this matter, it being largely determined by the general lay of the country. A good reservoir site should have a firm foundation for the dam and an ample supply of material of good quality easily available. The reservoir should be located so that but a short distance separates it from the land to be irrigated in order to avoid undue loss of water by seepage, and also to save cost of long ditches.

Design and Construction of Dam

The success of an earthen dam depends about equally on design, method of construction and material used, though for dams not over 12 feet high it is not so important that the requirements relating to material or method of construction be rigidly observed.

From investigation it appears that while pure gumbo has in most cases served satisfactorily in low dams, it has not done so in the higher dams, and that the best material to use is a mixture of gumbo or other clayey material and gritty material in the proportion of one part of gumbo to two or three parts of gritty material. No sod or other organic or perishable matter should be placed in the dam. It is preferable to have the material damp when put in place, its consistency being such as to readily pack hard with tramping of horses. All sod should be stripped from borrow pits before taking material therefrom to go in the dam. The base of the dam should be well plowed before any material is put in place in order to form a bond between the old and new material. No material should be borrowed from below the dam, and the foundation be firm ground.

The cross-section of the dam should be heavy enough to afford stability. The up-stream slope should be not steeper than one vertical to

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three horizontal, and the down-stream slope should not exceed one vertical to two horizontal. The top width should vary with the height, that for a dam less than 10 feet high being six feet; for a dam from 10 to 15. 15 feet high, eight feet; and for a dam 15 to 20 feet high, 10 feet.

Outlet. The outlet should be of such size as to supply enough water when fully open to practically fill the irrigation ditch. The loss of water in a ditch is much less for an irrigation operation when running a good head of water than when running a small amount, for which reason the outlet should rather be too large than too small. From this investigation it would appear that sizes from six inches to eight inches in diameter are those generally used.

Four kinds of outlets are available, viz.: Wooden box, wrought iron, cast iron, and earthenware pipe. The wooden box is a temporary affair and should never be used, because it will rot quickly and is very difficult and expensive to replace. Wrought iron pipe is often used and is fairly durable. It is not so lasting as cast iron which, however, is expensive and difficult to lay. Earthenware pipe is practically everlasting, but it requires great care in laying and, when used, should be protected against danger of settlement.

Protection of Slope. Ordinarily the material available for earthen dams on the prairies is more or less easily affected by water and the slopes should be protected against erosion. The rear or down-stream slope should be well grassed or sodded to protect it from the cutting action of rain and melting snow. The best protection for the water slope is paving composed of hard rocks, well bedded on a layer of gravel or broken stone. In most cases a plank revetment or wave fence has been used, where any protection was given to the water slope. This is not entirely satisfactory but it is cheaper and more quickly built than the paving. In many instances no stone is available and the wave fence is the only method that can be used for protection.

Wasteway. The wasteway is a very important feature for reservoir construction, and proper consideration should be given to its design and location in building a reservoir. If the topography will permit, the wasteway should be located some distance away from the dam, in order to prevent overflow or waste water from coming in contact with any part of the dam. A low place or gap in the high ground surrounding a reservoir may sometimes be found, and in such a case, this would probably be available for a wasteway.

When the topography is such that the wasteway may not be located entirely apart from the dam, it should be constructed around one or both ends of the dam. This may be done either by excavating a channel sufficiently large to carry away the waste water, or by building the dam high enough to form a wasteway of the natural ground.

In nearly all wasteways the water drops rapidly in a short distance before it re-enters the stream, and in such cases erosion is sure to take

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place unless measures are taken to prevent cutting. This may be done either by paving the bottom of the steep portion of wasteway, or constructing checks in such a manner as to prevent the fall from receding. Such checks may be built of masonry, concrete, timber or brush; and care should be taken by means of aprons and wings to prevent the water from passing under or around the structure and undermining it.

Catchment Area. A reservoir designed for irrigation purposes should have a catchment area of sufficient size to provide a suitable water supply, otherwise the expense of construction would be a useless waste of money. The size of the catchment area required will depend upon local conditions relating mainly to rainfall, evaporation, seepage and run-off. Taking into consideration the average conditions in the western counties of the state where reservoir construction has been most active, it is thought that the extent of the catchment area in acres should be not less than seven times the capacity of the reservoir in acre-feet. The duty of water for efficient irrigation is about two acre-feet per acre per annum; that is, for every acre to be irrigated there should be storage capacity sufficient to provide water over it to a depth of two feet.

The Belle Fourche project has a reservoir with a capacity of 203,770 acre-feet, and the irrigable land under it is about 100,000 acres, which is practically the ratio above designated. On this basis, for irrigating 40 acres, a reservoir should be provided with a capacity of 80 acre-feet of water. Such a reservoir should have a catchment area of about 560 acres to provide a sufficient supply of water for irrigation.

The above described system is a good example of storm water reservoirs constructed for irrigation purposes in this state. This method is being employed to reclaim land entered under the Desert Land Act, and many such entries have been made in Butte, Meade and Pennington counties. By this method the storm water from an extensive area is used to irrigate smaller areas below.

The construction of small reservoirs for impounding storm water in South Dakota is encouraged by the State Engineer's office, for the reason that such reservoirs are not only useful for irrigation, but they catch and return part of the run-off of each rain storm, which would otherwise flow quickly into the larger streams. In this way some good results are obtained in mitigating the effects of overflow and floodings on the larger streams. Of course no very great amount of water in any one stream system is thus held back, but it is hoped that eventually a decided benefit in this respect will be effected when the number of reservoirs for impounding storm waters has been increased to the maximum limit.

The Duty of Water

Under the Water Code the maximum appropriation which can be made for irrigation is one cubic foot of water per second, or one second-foot for every 70 acres of land to be irrigated. So far as experience in this and other states has demonstrated, this allowance is somewhat in

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excess of the actual requirements of irrigation, but in granting permits to appropriate water this standard has been adhered to as constituting a fair average requirement of irrigation.

A cubic-foot of water per second for seventy acres is equivalent in South Dakota to five-sevenths (5-7) of a miner's inch per acre. The limit of a water right for irrigating 160 acres, therefore, is two and twenty-eight hundredths (2.28) cubic feet per second, or 114 miner's inches.

In issuing permits the State Engineer makes a reasonable allowance for the probable loss of water between the diversion point and the delivery point at the upper edge of the land to be irrigated.

Storage of Flood Waters

There are thousands of acres along the streams in the western part of the state that are unproductive because of lack of water. At the same time in all these streams immense volumes of water go to waste during the flood seasons and are lost to use. The obvious remedy for this condition of affairs is the construction and maintenance of large storage reservoirs for holding back this water. In this way the irrigation of 100,000 acres of land is made possible under the Belle Fourche project by storing the flood waters of that stream.

The development of irrigated farming in this state will sooner or later reach a stage where the construction of storage reservoirs on streams will become an important factor. Where the stream is one of considerable size numerous irrigation canals will be constructed from it and its entire normal flow will then be utilized and means will be provided for holding back the immense volume of water which goes to waste during periods of high water, so as to render it available in the drier part of the year. By such means many large tracts of non-productive land will be reclaimed.

Storm Water Irrigation

Another form of development in irrigated farming is along the line of conservation of storm waters. Irrigation so far has been practiced principally from flowing streams and large natural water supplies, little having been done toward conserving and developing the minor sources of supply. It is not claimed that the development of the small water supplies will do more than make available a small portion of the higher land away from the large sources of supply. The formation of small reservoirs by building dams across dry draws, as has been already described, will make possible the reclamation of many small tracts of land.

In the rolling prairies there are very many reservoir sites available, but careful search is necessary to reveal them. A large number of farmers in the western region are irrigating by means of storm water reservoirs tracts of land varying in size from 40 to 200 acres. There are hundreds of places in the country adjacent to the Black Hills where this

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method could be employed with good results and the land that would otherwise be without water made to produce fine crops.

Capacity of Open Ditches

In all operations connected with the use of water for irrigation or beneficial purposes it is essential to know the proper size of ditch to construct under different conditions of grade and soil, in order to convey a given quantity of water to the place of intended use. In irrigation operations it is necessary to have the ditch or canal of a certain size to supply the required volume of water to the tract to be irrigated. If this tract is of considerable size the ditch will pass along or through it for a considerable distance, and after supplying the upper laterals, a smaller volume of water will be required for the remainder of the tract, and the size of the main ditch can be reduced accordingly.

It is presumed that in the design and construction of all diversion works of any magnitude competent engineering skill will be utilized, but in many cases no engineer will be available, especially in isolated localities, and it is always important to know what is the proper method of constructing ditches. The fall of the ditch should not be too light, mainly for the reason that the size of channel required for delivering a given volume of water would in that case be unduly large. Another consideration is that a ditch with too light a fall will not be self cleaning and on account of the sluggish current, there will generally be a heavy deposit of silt in the bottom, necessitating expensive work in cleaning the channel every season.

On the other hand the fall of a ditch should not be excessive, for in such a case the current will be too swift and the flowing water will erode the sides of the channel and cause the banks to cave.

The nature of the soil through which a ditch is to be constructed will be an important factor in the velocity at which water can be safely carried, and also in the first cost of construction. Safe velocity is the highest velocity at which it is safe to allow water to flow in a ditch without eroding or washing the banks on either side of channel. The following table, which is from Kent's Engineer's Hand Book, is based on the results of experience:

Safe Velocity of Water in Ditches, in Feet Per Second

Soft brown earth	0.3
Soft loam	0.6
Pure sand	1.1
Gravel	2.6
Sandy soil, 15 per cent clay	1.2
Sand soil, 40 per cent clay	1.8
Loamy soil, 65 per cent clay	3.0
Clay loam, 85 per cent clay	4.8
Agricultural clay, 95 per cent clay	6.2
Clay	7.2

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The velocities given in the above table are for channels that are fairly smooth, and free from local obstructions, stones, grass and weeds.

The following table, showing the capacity of standard ditches and canals, is taken from Farmers' Bulletin No. 158, "How to Build Small Irrigation Ditches," published by the U. S. Department of Agriculture. This table gives dimensions of a number of small ditches, with the corresponding velocities and discharges for different grades; also the volume of material, in cubic yards, to be excavated per mile:

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VELOCITIES AND DISCHARGES OF DITCHES WITH DIFFERENT GRADES

Dimensions of Ditch				Grade of Ditch 6 inches per mile		Grade of Ditch 1 foot per mile		Grade of Ditch 2 feet per mile		Grade of Ditch 3 feet per mile	
Top Width	Bottom Width	Depth	Area of cross section	Velocity	Discharge	Velocity	Discharge	Velocity	Discharge	Velocity	Discharge
Feet	Feet	Feet	Sq. ft.	Feet per sec.	Cu. ft. per sec.	Feet per sec.	Cu. ft. per sec.	Feet per sec.	Cu. ft. per sec.	Feet per sec.	Cu. ft. per sec.
1.5	1	0.5	0.625	0.18	0.10	0.34	0.21	0.50	0.31	0.61	0.38
3.0	2	1.0	2.5	.35	.86	.48	1.21	.72	1.81	.87	2.27
4.5	3	1.5	5.625	.46	2.56	.67	3.77	1.00	5.60	1.20	6.72
6.0	4	2.0	10	.50	5.00	.85	8.50	1.24	12.40	1.49	14.90
7.25	5	2.25	13.78	.67	9.23	.96	13.23	1.38	19.02	1.69	23.29
8.5	6	2.50	18.12	.74	13.40	1.06	19.20	1.52	27.54	1.87	33.88
9.75	7	2.75	23.03	.81	18.65	1.15	26.48	1.66	38.23	2.04	46.98
11.0	8	3.0	28.50	.88	25.08	1.26	35.91	1.78	50.73	2.18	62.13
12.25	9	3.25	34.53	.93	32.13	1.34	46.27	1.93	66.64	2.36	81.49
13.50	10	3.5	41.12	1.00	41.12	1.44	59.21	2.04	83.88	2.50	102.78

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VELOCITIES AND DISCHARGES OF DITCHES WITH DIFFERENT GRADES—Continued

Dimensions of Ditch				Grade of Ditch 4 feet per mile		Grade of Ditch 5 feet per mile		Grade of Ditch 6 feet per mile		Grade of Ditch 7 feet per mile	
Top Width	Bottom Width	Depth	Area of cross section	Velocity	Discharge	Velocity	Discharge	Velocity	Discharge	Velocity	Discharge
Feet	Feet	Feet	Sq. ft.	Feet per sec.	Cu. ft. per sec.	Feet per sec.	Cu. ft. per sec.	Feet per sec.	Cu. ft. per sec.	Feet per sec.	Cu. ft. per sec.
1.5	1	0.5	0.625	0.71	0.44	0.81	0.51	0.91	0.57	0.96	0.60
3.0	2	1.0	2.5	1.01	2.53	1.16	2.89	1.29	3.23	1.37	3.42
4.5	3	1.5	5.625	1.39	7.84	1.59	8.97	1.78	9.97	1.88	10.56
6.0	4	2.0	10	1.74	17.40	1.99	19.90	2.21	22.10	2.34	23.40
7.25	5	2.25	13.78	1.96	27.00	2.18	30.04	2.43	33.48	2.63	36.24
8.5	6	2.50	18.12	2.20	39.86	5.45	44.39	2.68	48.56	2.90	52.54
9.75	7	2.75	23.03	2.36	54.34	2.63	60.56	2.88	63.20	3.12	71.85
11.0	8	3.0	28.50	2.56	72.95	2.86	81.50	3.13	89.20	3.38	96.32
12.25	9	3.25	34.53	2.73	94.26	3.05	105.31	3.34	115.33	.....	.....
13.50	10	3.5	41.12	2.86	117.18	3.22	132.40	.....	.....	.....	.....

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VELOCITIES AND DISCHARGES OF DITCHES WITH DIFFERENT GRADES—Continued

Dimensions of Ditch				Grade of Ditch 8 feet per mile		Grade of Ditch 9 feet per mile		Grade of Ditch 10 feet per mile		Volume of material to be removed per mile*
Top Width	Bottom Width	Depth	Area of cross section	Velocity	Discharge	Velocity	Discharge	Velocity	Discharge	
Feet	Feet	Feet	Sq. ft.	Feet per sec.	Cu. ft. per sec.	Feet per sec.	Cu. ft. per sec.	Feet per sec.	Cu. ft. per sec.	Cu. yds.
1.5	1	0.5	0.625	1.04	0.65	1.09	0.68	1.17	1.04	122
3.0	2	1.0	2.5	1.48	3.70	1.55	3.88	1.66	.26	489
4.5	3	1.5	5.625	2.03	11.42	2.13	11.99	2.28	12.85	1,100
6.0	4	2.0	10	2.53	25.30	2.66	26.60	2.85	28.50	1,956
7.25	5	2.25	13.78	2.81	38.72	2.98	41.05	3.13	43.13	2,695
8.5	6	2.50	18.12	3.10	56.16	3.28	59.42	3.46	62.69	3,544
9.75	7	2.75	23.03	3.33	76.68	.....	.....	.....	.....	4,504
11.0	8	3.0	28.50	.....	.....	.....	.....	.....	.....	5,573
12.25	9	3.25	34.53	.....	.....	.....	.....	.....	.....	6,752
13.50	10	3.5	41.12	.....	.....	.....	.....	.....	.....	8,041

* In computing the volume of material in cubic yards per mile to be removed in the construction of each ditch, it is assumed that the ditches follow the surface of the ground, thus maintaining a constant depth.

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The ditches whose dimensions are given in the foregoing table are of such sizes as would ordinarily be built. They vary from one foot to ten feet in width on the bottom and from six inches to three and a half feet in depth. It will be seen that the velocity of the water depends largely upon the cross-section areas of the ditches. The velocity in the smallest ditch, with a grade of six inches per mile, is .18 of a foot per second, while the velocity in the largest ditch given in the table for the same grade is one foot per second, or about five and one-half times as great. By comparing the velocities given in any one column of the table it is seen that the water in the largest ditch has four to five times the velocity that it has in the smallest one. Knowing the quantity of water which the ditch must carry, and the permissible grade, the size can be determined by reference to the table.

Losses from seepage and evaporation have not been taken into consideration. Experiments have shown that losses from these sources are in direct proportion to surfaces exposed to the soil and to the air. It is, therefore, advisable to use as high a velocity of the water in the ditch as the soil will permit.

Rainfall

The amount of precipitation in different parts of South Dakota is a matter of general interest, since upon it is dependent not only the volume of water available for irrigation in the western part of the state, but also that for the growth of crops in the eastern part. For several years past the rainfall over the entire state has been good and, as a result, abundant crops have been grown.

There have been, however, periods when the annual rainfall has been much smaller and such periods are likely to occur again. It is not likely that any permanent climatic changes have taken place, and while the annual precipitation may vary from year to year, in a long succession of years, the average results will be about the same for any two similar periods.

The following table has been compiled from the reports of the United States Weather Bureau, and also from local records.

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PRECIPITATION TABLE

Rain or Melted Snow—Inches and Hundredths

Year	NAME OF LOCALITY Flandreau	Aberdeen	Huron	Pierre	Rapid City	Ashcroft
1890	20.53	.....	14.68	13.28	14.02	.....
1891	20.72	15.96	20.17	13.18	16.75	.....
1892	26.36	30.24	25.17	18.81	20.08	.....
1893	20.26	21.96	16.94	14.56	9.61	13.64
1894	15.74	.....	13.56	7.82	13.75	15.12
1895	24.51	30.23	17.08	16.85	15.48	13.17
1896	31.33	.....	26.10	17.35	13.68	19.46
1897	26.35	35.54	22.74	18.84	12.32	10.50
1898	22.89	16.11	15.62	10.55	10.98	15.24
1899	20.97	33.92	13.66	20.00	16.71	14.41
1900	26.14	23.07	24.73	16.81	13.32	12.92
1901	22.72	.....	21.98	17.04	23.25	11.39
1902	26.14	.....	16.42	20.04	18.51	16.00
1903	29.35	27.47	13.83	19.53	21.28	13.21
1904	19.95	32.12	20.36	9.15	16.40	10.42
1905	38.64	33.28	28.93	20.46	27.06	13.77
1906	26.70	35.12	25.37	22.06	19.85	12.80
1907	23.16	19.61	15.05	14.02	13.04	11.21
1908	34.77	32.99	28.67	19.10	19.63	15.56
1909	25.04	25.38	19.14	12.99	20.38	.....
Average	25.12	27.54	20.01	16.13	16.81	13.68

Water Power Development

Among the permits which have been issued from this office for the appropriation of water for beneficial purposes have been a number granting the use of water for the development of power.

The enactment of the State Water Law by the legislature of 1907 had the effect of broadening the former irrigation code into a general water law, bringing all the waters of the state, except navigable streams, under state supervision. This law requires water users who undertake to produce water power and make other beneficial use of water to obtain permits for same from the State Engineer just as the irrigator has to do.

In past years most of the water power development in the state has been in the Black Hills, and there was comparatively little work done in this line east of the Missouri river. A number of years ago there were several water power plants constructed and operated on the Big Sioux river. Many of these have been discontinued, however, and there are comparatively few of them in operation today. Two of these old projects, viz.: The Cascade Milling Company and the Queen Bee Milling Company, the latter comprising the greatest water power on the stream, were taken over by the Sioux Falls Light and Power Company, and consolidated into one large project. This latter company has built a magnificent power plant at Sioux Falls to develop the water power afforded by the fall in the river at that place.

In the Black Hills, where most of the water power development in the state has taken place, the power plants are located on the upper

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reaches of the streams, where the channels descend rapidly, affording opportunities for obtaining a good power head. Such locations are usually above the region of irrigation activity and the water is returned to the stream channel for use in irrigation work in the valley below.

A good example of water power development in this region is seen in the plant of the Black Hills Traction Company. The point of diversion of the water is about 2¼ miles east of the South Dakota-Wyoming boundary; it is about 10 miles southwest of the town of Belle Fourche, in Butte county. The water is taken from Redwater river just below its junction with Crow creek. The maximum volume of water taken is about 150 second-feet; this is conveyed about 5½ miles through canal and flume to a forebay situated 4,480 feet away from the power house and 117 feet higher than same. From the forebay the water is conveyed to the power house through a wood-stave, steel-banded pipe.

The power house is situated on the bank of the river, above the high water level of the stream at that point. Power is carried through a transmission line across country through the town of Spearfish to Deadwood and Lead, where it is used in mining operations.

All the appropriations of water for power purposes in the state that are of any importance are on record in this office. Some of the works authorized by these appropriations have been completed and are now in operation. Others are under construction, while still others are only pro jected.

Since the publication of the Second Biennial Report of the State Engineer, several permits have been issued for the right to appropriate water for power purposes. One of the more important permits is that issued to the Dakota Power Company of Rapid City. This comprises the consolidation of the permits of J. L. Duncan, No. 30, Geo. B. Mansfield, No. 46, and L. A. Richards, No. 27. The company has two miles of ditch and flume completed, rights of way secured, and a franchise to operate and maintain a power plant and to furnish electricity for all purposes in Rapid City, South Dakota.

The carrying capacity of the ditch and flume is 7,200 cubic feet of water per minute, developing 10½ horse power per foot of fall or head.

The present fall or head is 79 feet. The company is now arranging to extend the flume to a point where a fall or head will develop 1,500 to 1,800 effective horse power, a distance of 1.8 miles from the present flume end, giving a fall or head of 178 feet, allowing for a constant flow of water of eighty cubic feet per second.

A reservoir site has been selected that will hold 3,500,000 cubic feet of water to carry "peak" or maximum loads, enabling the company to handle 20 per cent more power than actually developed by water flowing through the flume.

The company has about completed an auxiliary power station in Rapid City. This will furnish power generated by two steam turbines,

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to take care of local requirements pending the completion of the water power plant.

Permit No. 72-1, issued to Todd M. Pettigrew, calls for the diversion of 125 cubic feet of water per second from Spearfish creek for the purpose of generating power by turbine for electrical transmission. At the request of Mr. Pettigrew, the State Engineer made an examination of the local conditions affecting this proposed power plant and found same to be favorable for the construction and operation of an efficient water power plant.

The Homestake Power Plant

Perhaps the most important water power development in the state is that undertaken by the Homestake Mining Company, under permit No. 43-1.

This project comprises the utilization of the flow of Spearfish creek under a high head to generate power for use in the great Homestake mines at Lead City. As an engineering proposition of considerable magnitude this work deserves more than passing notice. The flow of Spearfish creek is diverted by means of a concrete dam and carried through a series of tunnels, several thousand feet in aggregate length to the forebay or head of pressure pipe. The water is delivered to the turbines under a head of several hundred feet. It is claimed that about 5,000 horse power will be generated by this plant. The construction work, which is well along toward completion, is characterized by massiveness and solidity. The diversion dam is of reinforced concrete, of ample size and section for the purpose required. The forebay and entrance to tunnel is also of concrete. The tunnels are principally through rock formation; they are lined with concrete, the arch ring being of concrete blocks molded to form a three-centered arch.

Other permits for the diversion of water for power purposes have been issued to Frank M. Stewart, John S. Fuson and Charles L. Sprague, No. 64-2; Otho Development and Power Company, No. 73-2; H. W. Hinrichs, No. 74-2; Albert S. Halley and James Halley, Jr., No. 76-2; James A. Clark, No. 71-2; Castle Creek Hydraulic Gold Mining Company, No. 63-2; F. W. Bock and L. D. Bailor, No. 56-1; The Black Hills Traction Company, No. 52-1. The latter permit has been transferred to the Consolidated Power and Light Company of Deadwood.

All the filings for appropriations of water for power purposes in the state are on record in this office. Some of the works authorized by these filings have been completed and are now in operation. Others are under construction, and still others are only projected.

The following table contains a statement of the various appropriations for power purposes.

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WATER POWER PROJECTS IN THE STATE

Name of Company	Date for Completion	Vol. of Water Sec. feet	Horse Power	Location
Black Hills Traction Company, No. 1	Completed ..	150	1,600	Redwater river
Black Hills Traction Company, No. 2	Feb. 20, 1912	230	1,800	Redwater river
Rapid River Milling Co.	Completed ..	60	88	Rapid City
Rapid City Electric and Gas Light Company	Completed ..	60	100	Rapid City
E. S. Johnson	July 1, 1911	60	40	Rapid City
*J. L. Duncan	Apr. 18, 1910	100	4,000	Rapid creek
Hawthorne Ditch Company.	June 10, 1913	40	300	Rapid creek
Hill City Electric Power & Mining Company	June 15, 1913	25	150	Hill City
*Geo. B. Mansfield	Oct. 1, 1910	200	10,000	Rapid creek
Iowa Ditch Company	Mar. 27, 1910	75	200	Rapid creek
Golden West Mining Co.	June 25, 1913	35	500	Rochford
*Louis A. Richards	Mar. 1, 1910	150	1,600	Rapid creek
Sioux Falls Light & Power Company, No. 1	Completed ..	500	2,300	Sioux Falls
Sioux Falls Light & Power Company, No. 2	Sep. 27, 1912	500	150	Sioux Falls
E. W. Coughran	Sep. 27, 1910	400	775	Sioux Falls
Water, Light & Power Co..	Completed ..	30	400	Hot Springs
Electric Light & Power Co.	Completed ..	250	100	Sioux Falls
Electric Light & Power Co., Extension	Nov. 20, 1912	500	750	Sioux Falls
Teddy Bear Gold Mining Co.	Mar. 25, 1913	25	198	Castle creek
Gordelia Mining Company..	Completed ..	1	10	Rochford
E. C. Engel	July 16, 1910	5	50	Pine creek
Montezuma Gold Mining Co.	Oct. 23, 1912	60	690	Rapid creek
Belle Fourche Power Canal.	Completed ..	30	65	Belle Fourche
Todd M. Pettigrew	Nov. 2, 1911	60	400	Spearfish creek
Spearfish Light and Power Company	Completed ..	60	200	Spearfish creek
Homestake Water Power Plant	Feb. 5, 1911	60	5,000	Spearfish creek
F. M. Stewart, et al	Mar. 6, 1912	16	85	Beaver creek

Measurement of Water

In the development of water power, as well as in irrigation operations, the first and most important facts are to ascertain the height of head and quantity of water that can be utilized.

For small streams where it is very important to know what quantity of water can be relied upon, there is no better method of ascertaining this than by weir measurement. A weir is a dam extending across a stream at right angles to the flow of the current, and having a rectangular notch not exceeding two-thirds of the width of the stream and of sufficient depth to pass the water of the stream after it has first been set back to a dead level. The bottom and ends of the notch should be beveled on the down stream side, leaving the upper edge almost sharp. Drive a stake in the bed of the stream several feet from the board on the up-stream side so that the top of stake is level with the bottom edge

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of the notch, this level being easily found when the water is beginning to spill over the notch. By taking the length of the weir and the depth of the water passing over the weir, which is the distance from the top of the stake to the surface of the water above, the amount of water discharged can be obtained from the following table:

TABLE FOR WEIR MEASUREMENT

Giving Cubic Feet of Water Per Minute That Will Flow Over a Weir One Inch Wide and From One to 20⅞ Inches Deep

Inches	⅛	¼	⅜	½	⅝	¾	⅞
1..... .40	.47	.55	.64	.73	.82	.92	1.02
2..... 1.13	1.23	1.35	1.46	1.58	1.70	1.82	1.95
3..... 2.07	2.21	2.34	2.48	2.61	2.76	2.90	3.05
4..... 3.20	3.35	3.50	3.66	3.81	3.97	4.14	4.30
5..... 4.47	4.64	4.81	4.98	5.15	5.35	5.51	5.69
6..... 5.87	6.06	6.25	6.44	6.62	6.82	7.01	7.21
7..... 7.40	7.60	7.80	8.01	8.21	8.42	8.63	8.83
8..... 9.05	9.26	9.47	9.69	9.91	10.13	10.35	10.57
9.....10.80	11.02	11.25	11.48	11.71	11.94	12.17	12.41
10.....12.64	12.88	13.12	13.36	13.60	13.85	14.09	14.34
11.....14.59	14.84	15.09	15.34	15.59	15.85	16.11	16.36
12.....16.62	16.88	17.15	17.41	17.67	17.94	18.21	18.47
13.....18.74	19.01	19.29	19.56	19.84	20.11	20.39	20.67
14.....20.95	21.23	21.51	21.80	22.08	22.27	22.65	22.94
15.....23.23	23.52	23.82	24.11	24.40	24.70	25.00	25.30
16.....25.60	25.90	26.20	26.50	26.80	27.11	27.42	27.72
17.....28.03	28.34	28.65	28.97	29.28	29.59	29.91	30.22
18.....30.54	30.86	31.18	31.50	31.82	32.15	32.47	32.80
19.....33.12	33.45	33.78	34.11	34.44	34.77	35.10	35.44
20.....35.77	36.11	36.45	36.78	37.12	37.46	37.80	38.15

By multiplying the number of cubic feet that one inch in width will discharge by the width of the weir in inches it will give the total discharge of the weir per minute. Care must be taken to have the board of sufficient width to set the water back to a dead level before it passes over the weir; that the water has a clear fall of not less than eight inches below the crest of the weir; and that the measurement of the depth of water passing over the weir be taken when the stream's full capacity of water is passing over the weir. The structure should be strongly built, with solid foundation and substantial bracing. The planking should be rigid, so as to prevent vibration of the framework or crest, and the sides and bottom should be properly joined to the surrounding material in order to prevent leakage under or around the weir. An apron or floor should be placed on the down-stream side of weir to receive the falling water and prevent undermining.

Measurement of Large Streams. In streams too large to measure by weir, the quantity of water is usually determined by "float measurement." In the use of this method it is important that the float be so made that it sinks well into the water. The measurements should be taken at a point where the velocity is not too great, and where the bed of the stream is uniform. If the stream be wide, the velocity in feet per

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minute should be taken near the shore and in the center; the average then is the velocity of the stream.

To ascertain the cubic feet of water, multiply the depth by the width, multiply this product by the velocity in feet per minute, and the result will be the number of cubic feet flowing per minute.

Artesian Wells

One of the valuable natural resources of South Dakota is the underground water supply from which the vast number of flowing wells in the state are fed. Much valuable information concerning the origin of these underground waters is furnished by Mr. N. H. Darton, in Water Supply Paper No. 227, of the U. S. Geological Survey.

According to Mr. Darton, there are several sources of underground waters in South Dakota, but the Dakota and associated sandstones furnish the supply for most of the artesian wells. On account of the high elevation of its intake zone along the Black Hills this water is under great pressure and will afford flows in all but the highest lands except in the southeast corner of the state, where the head is lost in approaching the area in which the sandstone reaches the surface. Several thousand wells have been sunk east of the Missouri river, many of them being from 500 to 1,000 feet deep. There is a group of flowing wells about Belle Fourche, and a number of wells are in operation in Bad River Valley. Besides these there are many flowing wells on the west side of the Missouri near Fort Pierre. The aggregate flow from these wells is several million gallons per day. It is believed by many people that this great draft is diminishing the available supply of the underground water, but there is no evidence as yet that this is the case except locally in districts where there are numerous wells. Individual wells often diminish in flow and pressure, but this is usually due to leakage or clogging, and new wells in the same vicinity show the same flow and pressure as were found in the older ones. However, it is probable that with increased numbers of wells and long continued flow the available artesian supply will eventually be materially diminished.

Early in the present year, the State Engineer undertook the collection of and compilation of all the information available concerning the number and extent of artesian wells flowing in the state of South Dakota, both east and west of the Missouri river. A late publication of the U. S. Geological Survey gave the approximiate number of wells in the state as about one thousand, and believing that this number came far below the actual number of flowing wells in South Dakota, letters of inquiry were sent out to the auditors of the counties under which the artesian basin lies. Some of these replies were very meager, the informants stating that they knew of no record from which statistics regarding the wells in their counties could be obtained. In every possible instance information was requested concerning the matter and many letters of inquiry have been addressed to public officials, private individ-

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uals, corporations and local companies. From the amount of information obtained a list of the wells known to be existing in this state have been prepared. In some cases information has been obtained from publications of the U. S. Geological Survey, and the following list is as nearly complete as it has been possible to obtain:

ARTESIAN WELLS IN SOUTH DAKOTA

Aurora County

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
NW¼ Sec. 1, T. 101, R. 64	630	.....	10	Yield estimated
SW¼ Sec. 17, T. 101, R. 66	960	2	60	
NE¼ Sec. 3, T. 101, R. 66	800	2	50	
SW¼ Sec. 6, T. 101, R. 66	730	2	30	
Sec. 1, T. 102, R. 63	300	.....	5	Yield estimated
Sec. 10, T. 102, R. 63	536	.....	3	Yield estimated
NE¼ Sec. 10, T. 102, R. 63	613	2	3	
Sec. 11, T. 102, R. 63	460	.....	3	Yield estimated
SE¼ Sec. 17, T. 102, R. 65	850	4½	600	Pressure 55 lbs.
NW¼ Sec. 19, T. 102, R. 64	800	3–2	40	Pressure 78 lbs.
NW¼ Sec. 19, T. 102, R. 64	800	3–2	40	
SE¼ Sec. 29, T. 102, R. 64	600	2	8	
Sec. 25, T. 102, R. 65	795	2	10	Pressure 40+ lbs.
SW¼ Sec. 7, T. 102, R. 66	800	2	120	
Sec. 17, T. 102, R. 66	835	4½	400	
T. 103, R. 63	705	3	200	
SW¼ Sec. 28, T. 103, R. 63	716	3	200	
T. 103, R. 63	530	2	30	
Sec. 14, T. 103, R. 63	420	2	30	
SW¼ Sec. 8, T. 103, R. 63	755	3	100	Pressure 80 lbs.
Sec. 26, T. 103, R. 63	530	2	10	
Sec. 26, T. 103, R. 63	490	2	10	
Sec. 35, T. 103, R. 63	484	4–3	10	Yield estimated
Sec. 32, T. 103, R. 63	623	3–2	15	
Sec. 4, T. 103, R. 63	500	.....	10	Yield estimated
Sec. 8, T. 103, R. 63	755	.....	10	Yield estimated
Sec. 9, T. 103, R. 63	470	.....	10	Yield estimated
Sec. 10, T. 103, R. 63	900	2	4+	
Sec. 10, T. 103, R. 63	425	.....	10	Yield estimated
Sec. 11, T. 103, R. 63	440	.....	10	Yield estimated
Sec. 12, T. 103, R. 63	390	.....	10	Yield estimated
Sec. 13, T. 103, R. 63	380	.....	10	Yield estimated
Sec. 24, T. 103, R. 63	425	.....	10	Yield estimated
Sec. 24, T. 103, R. 63	378	.....	10	Yield estimated
Sec. 25, T. 103, R. 63	420	.....	10	Yield estimated
Sec. 35, T. 103, R. 63	507	.....	10	Yield estimated
Sec. 22, T. 103, R. 64	795	4½	100	Yield estimated
Sec. 22, T. 103, R. 64	775	4½	200	Pressure 55 lbs.
Plankinton	830	4½–3	225	
NW¼ Sec. 29, T. 103, R. 64	715	.....	1200	
Plankinton	745	4	60	
Sec. 27, T. 103, R. 64	765	.....	10	Yield estimated
SW¼ Sec. 31, T. 103, R. 65	830	2	40	
Sec. 34, T. 103, R. 66	842	6	10	Yield estimated
T. 103, R. 66	863	4	150	Pressure 35 lbs.
Sec. 10, T. 103, R. 66	900	2	4	Pressure 12+ lbs.
Sec. 11, T. 103, R. 66	830	2	4	Pressure 10+ lbs.
Sec. 22, T. 104, R. 63	525	4½–3	168	

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ARTESIAN WELLS IN SOUTH DAKOTA

Aurora County—Continued

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 1, T. 104, R. 63	470	2	4	
Sec. 21, T. 104, R. 63	523	4½	150	Pressure 45 lbs.
Sec. 21, T. 104, R. 63	525	4½	150	
Sec. 2, T. 104, R. 63	740	.....	10	Yield estimated
Sec. 3, T. 104, R. 63	508	.....	10	Yield estimated
Sec. 10, T. 104, R. 63	440	.....	10	Yield estimated
Sec. 15, T. 104, R. 63	465	.....	10	Yield estimated
Sec. 17, T. 104, R. 63	540	.....	10	Yield estimated
Sec. 20, T. 104, R. 63	530	.....	10	Yield estimated
Sec. 21, T. 104, R. 63	575	.....	10	Yield estimated
Sec. 23, T. 104, R. 63	364	.....	10	Yield estimated
Sec. 26, T. 104, R. 63	426	.....	10	Yield estimated
Sec. 35, T. 104, R. 63	400	.....	10	Yield estimated
Sec. 35, T. 104, R. 63	450	.....	10	Yield estimated
Sec. 34, T. 104, R. 64	590	.....	10	Yield estimated
Sec. 34, T. 104, R. 64	545	2	2½	
Sec. 26, T. 104, R. 65	728	2	84	
Sec. 3, T. 104, R. 66	922	2	75	
Sec. 2, T. 104, R. 66	844	2	150	
Sec. 24, T. 105, R. 63	487	2	32	
T. 105, R. 63	475	2	5	
Sec. 2, T. 105, R. 63	400	.....	10	Yield estimated
Sec. 7, T. 105, R. 63	580	.....	10	Yield estimated
Sec. 24, T. 105, R. 63	500	.....	10	Yield estimated
Sec. 26, T. 105, R. 63	490	.....	10	Yield estimated
Sec. 26, T. 105, R. 63	475	.....	10	Yield estimated
Sec. 28, T. 105, R. 63	508	.....	10	Yield estimated
Sec. 28, T. 105, R. 63	560	.....	10	Yield estimated
Sec. 35, T. 105, R. 63	620	.....	10	Yield estimated
Sec. 2, T. 105, R. 64	640	.....	10	Yield estimated
Sec. 22, T. 105, R. 64	563	.....	10	Yield estimated
SW¼ Sec. 32, T. 105, R. 66	1222	3	.....	
Sec. 24, T. 105, R. 66	953	2	60	
Sec. 35, T. 105, R. 63	620	.....	50	Yield estimated

Total yield, 5,264 gallons per minute.

Total number of wells, 82.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Beadle County

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 26, T. 109, R. 59	818	.....	85	
T. 109, R. 61	670	1¼	1500	
T. 109, R. 62	785–916	9¼–1¼	35–250	Pressure 125 lbs.
T. 109, R. 63	806–856	1¼	100	Yield estimated
T. 109, R. 64	830–910	1¼	45	
T. 109, R. 64	850	1¼	45	
T. 110, R. 59	857	2	50	
T. 110, R. 60	930	4	930	Pressure 100 lbs.
T. 110, R. 60	790	1¼	111	
T. 110, R. 60	770	1¼	35	
T. 110, R. 61	879	2	150–200	Pressure 60 to 100 lbs.
T. 110, R. 61	900	3	500	Pressure 125 lbs.
T. 110, R. 62	1040	8	350	
T. 110, R. 62	847	6–4	600	Pressure 120 lbs.
T. 110, R. 62	1080	5½	1500	
T. 110, R. 62	960	10–5⅝	2250	Pressure 165 lbs.
T. 110, R. 62	906	6	1500	Pressure 120 lbs.
T. 110, R. 63	840	2	600	Yield estimated
T. 110, R. 64	847	2	100	
T. 110, R. 65	870	1¼	50	
T. 111, R. 59	940	2	20	
T. 111, R. 59	925	2	50	
T. 111, R. 61	792	1¼	200	
T. 111, R. 61	836	3	360	
T. 111, R. 62	744–788	1¼–2	300	
T. 111, R. 63	780–918	2–1¼	45–114	
T. 111, R. 64	784–870	1¼–2	43–100	
T. 111, R. 64	930	8–5	330	Pressure 137 lbs.
T. 111, R. 65	1000	1¼	80	
T. 112, R. 59	913–933	1¼	35	
T. 112, R. 60	779	3	400-600	Pressure 120 lbs.
T. 112, R. 61	778–917	1¼–4	35	
T. 112, R. 61	777	3	600	Pressure 125 lbs.
T. 112, R. 62	793–817	1¼–3	40–240	Pressure in one well 50 lbs.
T. 112, R. 63	601–870	1¼–2	16–200	Pressure 20 to 90 lbs.
T. 112, R. 64	900	1¼	45	
T. 112, R. 65	955	1¼	40	
T. 113, R. 59	854	1¼	40	
T. 113, R. 60	810	2	200	Pressure 115 lbs.
T. 113, R. 61	750–810	3–1¼	60–125	
T. 113, R. 62	815	2	120	
T. 113, R. 63	890	2	300	Pressure 100 lbs.
T. 113, R. 63	900–912	1¼	50	
T. 113, R. 63	953	4–3	1260	Pressure 150 lbs.
T. 113, R. 64	1118	4½	1435	Pressure 175 lbs.
T. 113, R. 64	980	1¼	20	
T. 113, R. 65	933–1000	1¼	26–70	
T. 114, R. 59	1038	2	8	

Total yield, 17,778 gallons per minute.
Total number of wells, 48.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Bon Homme County

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 92, R. 60	885–920	2	500	Pressure 30 lbs.
T. 93, R. 58	630–665	3	95–100	Pressure 42 to 45 lbs.
T. 93, R. 59	530–855	1¼–3	15–252	Pressure 40 to 66 lbs.
T. 93, R. 60	620	6	700	
T. 93, R. 60	592	8	3292	Pressure 86 lbs.
T. 93, R. 60	828	1¼	72	Pressure 86 lbs.
T. 93, R. 61	735–1000	2–6	25–70	Pressure 12 to 14 lbs.
T. 93, R. 62	862–897	6	1400–1600	Pressure 62 to 58 lbs.
T. 94, R. 58	576–645	2–3	11–100	Pressure 40 lbs.
T. 94, R. 59	552–752	1–8	13–150	Pressure 40 lbs.
T. 94, R. 59	857	4½	1000	Pressure 30 lbs.
T. 94, R. 61	1074	3–2½	⅓	Pressure 2½ lbs.
T. 95, R. 59	730–828	2–3	26–97	
T. 95, R. 60	822	2	52	
T. 96, R. 58	582–680	6	9	
T. 96, R. 59	590–700	2–7	5	
T. 96, R. 60	565	.....	5	

Total yield, 8,004 gallons per minute.
Total number of wells, 17.

Brown County

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 25, T. 121, R. 60	1032	1¼	50	Pressure 120 lbs.
SE¼ Sec. 2, T. 121, R. 60	1064	1¼	30	Pressure 56 lbs.
SE¼ Sec. 17, T. 121, R. 60	935	1¼	57	Pressure 140 lbs.
SE¼ Sec. 15, T. 121, R. 61	912	1¼	40	Pressure 76 lbs.
SW¼ Sec. 13, T. 121, R. 61	897	1¼	50	Pressure 91 lbs.
SW¼ Sec. 9, T. 121, R. 61	930	1¼	43	Pressure 82 lbs.
SW¼ Sec. 33, T. 121, R. 61	900	1¼	40	Pressure 75 lbs.
NW¼ Sec. 8, T. 121, R. 61	875	1¼	43	Pressure 82 lbs.
NE¼ Sec. 19, T. 121, R. 62	900	2	250	Pressure 137 lbs.
NW¼ Sec. 7, T. 121, R. 62	900	2	300	Pressure 140 lbs.
NE¼ Sec. 10, T. 121, R. 63	900	2	90	Pressure 134 lbs.
NE¼ Sec. 2, T. 121, R. 63	940	2	90	Pressure 136 lbs.
Warner, T. 121, R. 64	956	1¼–2	96	Pressure 80 lbs.
T. 121, R. 65	1070	1¼	46	
NW¼ Sec. 11, T. 122, R. 60	983	2	50	Pressure 96 lbs.
SE¼ Sec. 2, T. 122, R. 60	1025	2	40	Pressure 88 lbs.
SW¼ Sec. 11, T. 122, R. 61	900–953	1¼–2	30	Pressure 42 lbs.
NE¼ Sec. 4, T. 122, R. 61	930	2	60	Pressure 117 lbs.
NW¼ Sec. 8, T. 122, R. 61	910	2	40	Pressure 90 lbs.
SE¼ Sec. 21, T. 122, R. 62	900–950	2	70	Pressure 102 lbs.
NW¼ Sec. 1, T. 122, R. 62	920	2	80	Pressure 104 lbs.
NE¼ Sec. 8, T. 122, R. 62	910	2	90	Pressure 130 lbs.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Brown County—Continued

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 122, R. 63	920–940	1¼	34	Pressure 120 lbs.
SE¼ Sec. 35, T. 122, R. 64	905	1¼	40	Pressure 80 lbs.
T. 122, R. 65	1080	1¼	46	
Groton, T. 123, R. 60	951	6	830	Pressure 135 lbs.
SW¼ Sec. 7, T. 123, R. 60	904	5	105	Pressure 80 lbs.
NE¼ Sec. 33, T. 123, R. 61	850	1¼	40	Pressure 73 lbs.
Chedi, T. 123, R. 61	1022	2	120	Pressure 150 lbs.
NE¼ Sec. 11, T. 123, R. 62	875	2	95	Pressure 135 lbs.
NE¼ Sec. 9, T. 123, R. 62	890	2	50	Pressure 57 lbs.
NW¼ Sec. 34, T. 123, R. 63	900	2	90	Pressure 103 lbs.
T. 123, R. 63	1117	6	1060	Pressure 138 lbs.
T. 123, R. 64	955	1¼	850	Yield estimated
T. 123, R. 64	1050	1¼	1060	Pressure 100 lbs.
T. 122, R. 64	918	1¼	330	Pressure 40 lbs.
T. 123, R. 64	1004	4	825	Pressure 62 lbs.
T. 123, R. 64	1300	6–4½	1350	
T. 123, R. 64	1300	8–4½	1000	
T. 123, R. 65	1070–1167	1¼	53	
T. 124, R. 60	885–942	4–2½	150	Pressure 127 lbs.
T. 124, R. 61	912	2	150	
T. 124, R. 62	900	1¼	25	
T. 124, R. 63	945	2	123	
T. 124, R. 64	875–975	1¼	31	
T. 124, R. 65	.....	1¼	20	
T. 125, R. 62	942–983	1¼–4½	940	Pressure 160 lbs.
T. 125, R. 61	716	1¼	10	
T. 125, R. 63	942–983	1¼	35	
T. 125, R. 64	1050	2	40	
T. 125, R. 65	1021–1100	1¼	48	
T. 126, R. 60	950	2	248	
T. 126, R. 61	965	2	245	Pressure 135 lbs.
T. 126, R. 64	1030	6	300	Pressure 35 lbs.
T. 126, R. 65	1073–1150	1¼–2	136	
T. 127, R. 61	960	2	56	
T. 127, R. 62	900–940	1¼	36	
T. 127, R. 63	800–856	1¼	20	
T. 127, R. 64	1094–1200	6–4	139	Pressure 70 lbs.
T. 127, R. 65	1084–1200	2	30	
T. 128, R. 60	840	2	30	Yield estimated
T. 128, R. 61	920	1¼	20	
T. 128, R. 61	1270	3	144	
T. 128, R. 62	975	2	100	
T. 128, R. 65	1082	3	20	

Total yield, 12,759 gallons per minute.
Total number of wells, 64.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Brule County

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 101, R. 67	750–950	1¼–3	18–60	Pressure 20 to 40 lbs.
T. 101, R. 68	815–962	1¼–3	20–1098	Pressure 12 to 25 lbs.
T. 101, R. 69	.....	3	50	Yield estimated
T. 102. R. 67	750–880	2–3	18–100	Pressure 40 lbs.
T. 102, R. 68	800–1050	1¼–4	1000	Pressure 10 lbs.
T. 102, R. 69	900	2–3	800	Pressure 5 to 40 lbs.
T. 102, R. 70	1027–1230	2–6	400–900	Pressure 2 to 40 lbs.
T. 102, R. 70	1100	5	800	
T. 102, R. 70	1165	2	50	Yield estimated
T. 102, R. 71	1230–1270	8	605	
T. 103, R. 67	840–956	2–3	40–90	
T. 103, R. 68	900–1210	2–6	60–750	
T. 103, R. 68	1254	6	185	Pressure 7 to 20 lbs.
T. 103, R. 69	983–1210	2	60	Pressure 40 lbs.
T. 103, R. 71	1063–1100	1¼–6	25–1000	
T. 104, R. 68	960	2–1¼	128	
T. 104, R. 69	940–1200	2–3	60–70	
T. 104, R. 70	927	10	1385	
T. 104, R. 71	600–1186	2–8	300	
T. 104, R. 71	1026	8	3000	
T. 104, R. 71	645–670	8	4500	
T. 104, R. 71	540–600	4–6	5000	
T. 104, R. 71	815–960	6–4	537–700	
T. 105, R. 67	940	2	80	
T. 105, R. 68	930–987	2–6	300–815	Pressure 5 to 75 lbs.
T. 105, R. 69	1075	2	30	Pressure 16 lbs.
T. 105, R. 69	965	2	80	

Total yield, 23,636 gallons per minute.
Total number of wells, 26.

Buffalo County

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 106, R. 68	975	2	140	
T. 106, R. 69	875	3–2	135	Pressure 75 lbs.
T. 107, R. 69	1174	2–1¼	45	
Sec. 1, T. 108, R. 70	1450	2	27	Pressure 8 lbs.
Crow Creek Agency	780	6	200	Pressure 180 lbs.

Total yield, 547 gallons per minute.
Total number of wells, 5.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Butte County

LOCATION	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Belle Fourche City wells—				
No. 1	550	.....	13	Pressure 55 lbs.
No. 2	525	.....	51	Pressure 45 lbs.
No. 3	881	4	25	
Belle Fourche, 10 small wells	300–400	1–2	50	
Belle Fourche, Craft's addition	897	.....	45	Pressure 55 lbs.
NW¼ Sec. 11, T. 8, R. 2	635	1	15	Pressure 55 lbs.
NW¼ Sec. 11, T. 8, R. 2	745	.....	15	Pressure 40 lbs.
NW¼ Sec. 14, T. 8, R. 2	550	4½	100	Pressure 26 lbs.
NW¼ Sec. 6, T. 8, R. 3	835	2	30	Pressure 15 lbs.
SE¼ Sec. 36, T. 9, R. 2	836	2	15	
Sec. 19, T. 9, R. 4	1417	3–2	60	
SE¼ Sec. 31, T. 9, R. 3	935	2	5	
SE¼ Sec. 24, T. 8, R. 2	381	.....	2	Pressure 30 lbs.
SE¼ Sec. 14, T. 8, R. 2	241	1¼	2	
SE¼ Sec. 14, T. 8, R. 2	355	4½	40	Pressure 26 lbs.
SE¼ Sec. 12, T. 8, R. 2	818	2	5	
Sec. 36, T. 9, R. 2	627	2	20	
SE¼ Sec. 18, T. 9, R. 4	1388	2	1	Pressure 9 lbs.
SW¼ Sec. 4, T. 8, R. 3	1033	2	15	Pressure 15 lbs.
SE¼ Sec. 23, T. 10, R. 2	2019	.....	20	Yield estimated
NW¼ Sec. 4, T. 9, R. 4	1858	1¼	3½	
SE¼ Sec. 13, T. 8, R. 4	1096	2	60	
NE¼ Sec. 20, T. 8, R. 2	330	4	25	Pressure 30 lbs.
NE¼ Sec. 20, T. 8, R. 2	225	6	15	
SW¼ Sec. 13, T. 8, R. 2	330	.....	5	Pressure 15 lbs.
NE¼ Sec. 28, T. 8, R. 2	320	.....	5	Pressure 5 lbs.
Hay Creek, 6 miles west of Belle Fourche	220	4	25	
SW¼ NE¼ Sec. 17, T. 8, R. 2	535	3	5	Pressure 10 lbs.
SE¼ NW¼ Sec. 13, T. 8, R. 3	600	4	450	Pressure 125 lbs.
SW¼ Sec. 14, T. 9, R. 2	900	.....	20	
Sec. 6, T. 8, R. 2	900	3	15	Pressure 20 lbs.
NE¼ Sec. 35, T. 9, R. 1	350	4	5	
SE¼ Sec. 17, T. 8, R. 1	280	.....	5	
NE¼ Sec. 20, T. 8, R. 1	356	4½	1½	
NW¼ Sec. 8, T. 8, R. 1	700	.....	15	Yield estimated
NE¼ Sec. 9, T. 9, R. 7	460	6	25	Yield estimated
Vale	2215	.....	5	Yield estimated
Sec. 14, T. 10, R. 2	2100	.....	16	
Sec. 26, T. 9, R. 1	.....	.....	10	Yield estimated
Sec. 25, T. 9, R. 2	.....	.....	5	Yield estimated
Sec. 35, T. 9, R. 2	.....	.....	7	Yield estimated
Sec. 33, T. 9, R. 3	.....	.....	5	Yield estimated
Sec. 2, T. 9, R. 4	.....	.....	10	Yield estimated
Sec. 20, T. 9, R. 4	2000	.....	60	
Sec. 22, T. 8, R. 1	.....	.....	5	Yield estimated
Sec. 23, T. 8, R. 1	.....	.....	10	Yield estimated
Sec. 24, T. 8, R. 1	.....	.....	10	Yield estimated
Sec. 9, T. 8, R. 2	.....	.....	10	Yield estimated
Sec. 15, T. 8, R. 2	.....	.....	20	Yield estimated
Sec. 19, T. 8, R. 2	.....	.....	15	Yield estimated
Sec. 21, T. 8, R. 2	.....	.....	10	Yield estimated
Sec. 5, T. 8, R. 3	.....	.....	5	Yield estimated
Sec. 26, T. 8, R. 4	.....	.....	10	Yield estimated
Sec. 32, T. 8, R. 6	.....	.....	10	Yield estimated
Sec. 13, T. 8, R. 3	.....	.....	300	Yield estimated

Total yield, 1,731 gallons per minute.
Total number of wells, 65.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Charles Mix County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 94, R. 64	651	6	3000	Pressure 119 lbs.
T. 95, R. 63	795	4	10	Yield estimated
T. 95, R. 64	1020	2	.....	No flow
T. 95, R. 65	730	1	16	Pressure 40 lbs.
T. 96, R. 62	150	.....	5	Yield estimated
T. 96, R. 63	151	2	15	
T. 96, R. 64	144	2	7½	
T. 96, R. 65	775½–802	.....	1500	Pressure 70 lbs.
T. 96, R. 67	266	.....	.....	Pressure 10 lbs.
T. 96, R. 68	810	4½	37	
T. 97, R. 63	150	.....	.....	
T. 97, R. 66	800–905	1–2	4–20	
T. 97, R. 67	700–900	1¼–4½	5–150	Pressure 5 lbs.
T. 98, R. 64	772	2	200	Pressure 52 lbs.
T. 98, R. 65	920–940	2	6–11	Pressure 2 to 8 lbs.
T. 98, R. 66	820–950	2–3	50–65	Pressure 24 to 30 lbs.
T. 98, R. 67	800–991	1–3	6–65	Pressure 63 lbs.
T. 98, R. 68	800–1110	1¼–3	10–150	Pressure 3 to 80 lbs.
T. 98, R. 68	1200	6	.....	No flow
T. 98, R. 69	644	6	50	Pressure 24 lbs.
T. 99, R. 66	840	1¼	20	Pressure 24 lbs.
T. 99, R. 67	730–950	1¼–3	4–50	Pressure 50 lbs.
T. 99, R. 68	720–1006	1–3	2–78	Pressure 40 lbs.
T. 99, R. 69	944–966	3–2	60	Pressure 50 lbs.
T. 99, R. 70	840–1000	1¼–3	10–30	Pressure 26 to 26 lbs.
T. 100, R. 67	734–875	1¼–3	20–120	Pressure 87 lbs.
T. 100, R. 68	720–930	1–2	7–31½	Pressure 13 lbs.
T. 100, R. 69	856–1030	2	15–125	Pressure 15 lbs.
T. 100, R. 70	890–900	1¼–2	16	Pressure 30 lbs.
Sec. 26, T. 100, R. 71	688	8	1700	
Sec. 29, T. 100, R. 71	785	8	500	
Sec. 18, T. 100, R. 71	868	8	2352	

Total yield, 10,384 gallons per minute.
Total number of wells, 32.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Clay County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 8, T. 91, R. 51	275	1¼	20	
Sec. 9, T. 91, R. 51	210	2	10	Yield estimated
Sec. 4, T. 91, R. 51	280	2	6	
Sec. 3, T. 91, R. 51	.....	1	5	Yield estimated
Sec. 3, T. 91, R. 51	.....	2	10	Yield estimated
Sec. 7, T. 91, R. 51	.....	2	10	Yield estimated
Sec. 21, T. 92, R. 51	.....	1	5	Yield estimated
Sec. 28, T. 92, R. 51	.....	2	10	Yield estimated
Sec. 33, T. 92, R. 51	400	3–2	15	Yield estimated
Sec. 13, T. 92, R. 52	365	2	90	
Sec. 13, T. 92, R. 52	366	4½–3	30	
Sec. 17, T. 92, R. 52	339	2	10	Yield estimated
Vermillion, T. 92, R. 52	335	2	200	
Vermillion, T. 92, R. 52	507	3	20	Yield estimated
T. 92, R. 52	296	2	9	
Sec. 19, T. 92, R. 52	325	2	2	
Sec. 33, T. 92, R. 52	289	2	40	
Sec. 34, T. 92, R. 52	300	2	50	
Sec. 18, T. 92, R. 52	300	2	15	
T. 92, R. 52	.....	1	5	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	1½	10	Yield estimated
T. 92, R. 52	.....	2	15	Yield estimated
T. 92, R. 52	.....	2	15	Yield estimated
T. 92, R. 52	.....	1	5	Yield estimated
T. 92, R. 52	.....	1¼	15	Yield estimated
T. 92, R. 52	.....	1½	10	Yield estimated
T. 92, R. 52	.....	1	5	Yield estimated
T. 92, R. 52	.....	2	20	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	1	5	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	3	20	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	1	5	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
T. 92, R. 52	.....	2	10	Yield estimated
Sec. 12, T. 92, R. 53	290	2	10	Yield estimated
Secs. 6 and 5, T. 92, R. 53	280	2	2½	
SE¼ Sec. 1, T. 92, R. 53	.....	2	2	
SW¼ Sec. 1, T. 92, R. 53	.....	2	1	
SW¼ Sec. 4, T. 92, R. 53	.....	2	1	
SE¼ Sec. 4, T. 92, R. 53	.....	2	2	
NW¼ Sec. 6, T. 92, R. 53	.....	2	⅛	
NW¼ Sec. 6, T. 92, R. 53	.....	2	4	
SE¼ Sec. 6, T. 92, R. 53	.....	2	4	
SE¼ Sec. 7, T. 92, R. 53	.....	2	2	

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Clay County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
NW¼ Sec. 8, T. 92, R. 53	.....	2	5	
SW¼ Sec. 8, T. 92, R. 53	.....	2	2	
SE¼ Sec. 8, T, 92, R. 53	.....	2	4	
SE¼ Sec. 8, T, 92, R. 53	.....	2	2	
SW¼ Sec. 9, T. 92, R. 53	.....	2	5	
SE¼ Sec. 9, T. 92, R. 53	.....	2	4	
SW¼ Sec. 10, T. 92, R. 53	.....	2	⅛	
NE¼ Sec. 11, T. 92, R. 53	.....	2	1	
NW¼ Sec. 11, T. 92, R. 53	.....	2	3	
NW¼ Sec. 11, T. 92, R. 53	.....	2	2	
NW¼ Sec. 11, T. 92, R. 53	.....	2	3	
SE¼ Sec. 11, T. 92, R. 53	.....	2	2	
NE¼ Sec. 13, T. 92, R. 53	.....	2	4	
NW¼ Sec. 13, T. 92, R. 53	.....	2	3	
NE¼ Sec. 14, T. 92. R. 53	.....	2	3	
SW¼ Sec. 14, T. 92, R. 53	.....	2	⅛	
SE¼ Sec. 14, T. 92, R. 53	.....	2	1	
NE¼ Sec. 15, T. 92, R. 53	.....	2	6	
SW¼ Sec. 15, T. 92, R. 53	.....	2	3	
SE¼ Sec. 15, T. 92, R. 53	.....	2	2	
NE¼ Sec. 16, T. 92, R. 53	.....	2	2	
SW¼ Sec. 16, T. 92, R. 53	.....	2	1	
SW¼ Sec. 16, T. 92, R. 53	.....	2	2	
NE¼ Sec. 17, T. 92, R. 53	.....	2	2	
NW¼ Sec. 17, T. 92, R. 53	.....	2	2	
SW¼ Sec. 17, T. 92, R. 53	.....	2	4	
SE¼ Sec. 17, T. 92, R. 53	.....	2	2	
NE¼ Sec. 18, T. 92, R. 53	.....	2	10	
NE¼ Sec. 21, T. 92, R. 53	.....	2	3	
NE¼ Sec. 21, T. 92, R. 53	.....	2	1	
NE¼ Sec. 23, T. 92, R. 53	.....	2	1–10	
NE¼ Sec. 6, T. 92, R. 52	.....	2	2	
NW¼ Sec. 5, T. 92, R. 52	.....	2	5	
NW¼ Sec. 7, T. 92, R. 52	.....	2	1	
SE¼ Sec. 7, T. 92, R. 52	.....	2	3	
NW¼ Sec. 8, T. 92, R. 52	.....	2	4	
SW¼ Sec. 8, T. 92, R. 52	.....	2	1	
SE¼ Sec. 17, T. 92, R. 52	.....	2	3	
SE¼ Sec. 17, T. 92, R. 52	.....	2	12	
NW¼ Sec. 17, T. 92, R. 52	.....	2	3	
NW¼ Sec. 18, T. 92, R. 52	.....	2	2	
SE¼ Sec. 18, T. 92, R. 52	.....	2	2	
NW¼ Sec. 19, T. 92, R. 52	.....	2	2	
Sec. 29, T. 93, R. 51	400	1¼	3	
Sec. 31, T. 93, R. 51	410	1	1	
Sec. 20, T. 93, R. 51	334	2	20	
Sec. 19, T. 93, R. 51	315	2	5	
Sec. 30, T. 93, R. 51	350	3–2	9	
Sec. 30, T. 93, R. 51	.....	¾	5	Yield estimated
Sec. 20, T. 93, R. 51	.....	1	5	
Sec. 17, T. 93, R. 51	.....	2	5	
Sec. 22, T. 93, R. 52	325	2	5	
Sec. 2, T. 93, R. 52	294	2	6	
Sec. 21, T. 93, R. 52	281	2	2	
Sec. 34, T. 93, R. 52	328	2	4	
Sec. 22, T. 93, R. 52	356	2	20	
Sec. 16, T. 93, R. 52	315	3–2	5	

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Clay County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
NW¼ Sec. 22, T. 93, R. 52	.....	1	1	
NE¼ Sec. 28, T. 93, R. 52	.....	1¼	1½	
NE¼ Sec. 28, T. 93, R. 52	.....	1¼	7	
NW¼ Sec. 22, T. 93, R. 52	.....	1	1½	
SW¼ Sec. 6, T. 93, R. 52	.....	2	6	
SW¼ Sec. 19, T. 93, R. 52	.....	2	5	
Sec. 16, T. 93, R. 53	270	2	60	
Sec. 31, T. 93, R. 53	310	2	60	
Sec. 31, T. 93, R. 53	.....	3	40	Yield estimated
Sec. 25, T. 93, R. 53	340	1	10	Yield estimated
Sec. 35, T. 93, R. 53	240	3	1	
Sec. 28, T. 93, R. 53	351	2	150	
Sec. 34, T. 93, R. 53	295	2	30	
Sec. 29, T. 93, R. 53	306	2	10	Yield estimated
Sec. 7, T. 93, R. 53	304	2	10	Yield estimated
Sec. 27, T. 93, R. 53	270	2	30	
Sec. 32, T. 93, R. 53	367	2	75	
Sec. 7, T. 93, R. 53	275	2	10	Yield estimated
Sec. 35, T. 93, R. 53	350	2	10	
Sec. 34, T. 93, R. 53	275	2	20	
Sec. 18, T. 93, R. 53	343	2	60	
Sec. 28, T. 93, R. 53	310	2	15	
Sec. 33, T. 93, R. 53	290	2	8	
Sec. 16, T. 93, R. 53	320	2	10	Yield estimated
Sec. 20, T. 93, R. 53	240	2	6	
Sec. 35, T. 93, R. 53	340	2	50	
Sec. 27, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 19, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 19, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 20, T. 93, R. 53	.....	3	10	Yield estimated
Sec. 9, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 19, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 6, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 35, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 35, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 19, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 26, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 33, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 29, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 24, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 6, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 30, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 34, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 27, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 29, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 30, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 30, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 33, T. 93, R. 53	.....	3	10	Yield estimated
Sec. 18, T. 93, R. 53	.....	3	10	Yield estimated
Sec. 23, T. 93, R. 53	.....	3	10	Yield estimated
Sec. 36, T. 93, R. 53	.....	3	10	Yield estimated
Sec. 22, T. 93, R. 53	.....	3	10	Yield estimated
Sec. 32, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 32, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 32, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 28, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 2, T. 93, R. 53	.....	3	15	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Clay County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 22, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 24, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 7, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 33, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 25, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 28, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 6, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 5, T. 93, R. 53	.....	3	20	Yield estimated
Sec. 25, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 25, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 14, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 26, T. 93, R. 53	.....	3	15	Yield estimated
Sec. 27, T. 93, R. 53	.....	3	10	Yield estimated
Sec. 5, T. 93, R. 53	.....	.....	10	Yield estimated
NW¼ Sec. 5, T. 94, R. 51	.....	2	2	
Sec. 11, T. 94, R. 52	402	2	5	
Sec. 15, T. 94, R. 52	400	1¼	5	Yield estimated
SW¼ Sec. 25, T. 94, R. 52	.....	.....	5	Yield estimated
Sec. 31, T. 94, R. 53	260	2	20	
Sec. 8, T. 94, R. 53	285	.....	5	Yield estimated
Sec. 33, T. 94, R. 53	500	2	10	Yield estimated
NW¼ Sec. 19, T. 94, R. 53	.....	1	2	
SW¼ Sec. 19, T. 94, R. 53	.....	1	2	
NE¼ Sec. 29, T. 94, R. 53	.....	2	1	
SW¼ Sec. 28, T. 94, R. 53	.....	1	5	
NE¼ Sec. 33, T. 94, R. 53	.....	1	5	
SE¼ Sec. 34, T. 94, R. 53	.....	2	2	
SW¼ Sec. 35, T. 94, R. 53	.....	2	15	
T. 94, R. 51	.....	2	10	Yield estimated
T. 94, R. 51	.....	2	10	Yield estimated
T. 94, R. 51	.....	2	5	Yield estimated
T. 94, R. 51	.....	2	5	Yield estimated
T. 94, R. 51	.....	2	10	Yield estimated
T. 94, R. 51	.....	2	5	Yield estimated
Sec. 32, T. 95, R. 52	260	2	1	
Sec. 9, T. 95, R. 52	500	3–2	3	
Sec. 29, T. 95, R. 52	275	2	4	
Sec. 22, T. 95, R. 52	360	2	2	
Sec. 2, T. 95, R. 53	.....	2	3	Yield estimated
SW¼ Sec. 2, T. 95, R. 53	.....	2	2	Yield estimated
SE¼ Sec. 3, T. 95, R. 53	.....	2	5	Yield estimated
NE¼ Sec. 12, T. 95, R. 53	.....	2	3	Yield estimated
NE¼ Sec. 36, T. 95, R. 53	.....	2	2	Yield estimated

Total yield, 2,644 gallons per minute.

Total number of wells, 214.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Davison County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 2, T. 101, R. 60	.....	2	10	Yield estimated
Sec. 6, T. 101, R. 60	.....	2	10	Yield estimated
Sec. 5, T. 101, R. 60	.....	2	10	Yield estimated
Sec. 9, T. 101, R. 60	.....	2	15	Yield estimated
Sec. 8, T. 101, R. 60	.....	2	15	Yield estimated
Sec. 15, T. 101, R. 60	.....	2	20	Yield estimated
Sec. 23, T. 101, R. 60	.....	2	20	Yield estimated
Sec. 21, T. 101, R. 60	.....	2	20	Yield estimated
Sec. 20, T. 101, R. 60	.....	2	25	Yield estimated
Sec. 20, T. 101, R. 60	.....	2	25	Yield estimated
Sec. 19, T. 101, R. 60	.....	2	30	Yield estimated
Sec. 19, T. 101, R. 60	.....	2	30	Yield estimated
Sec. 27, T. 101, R. 60	.....	2	35	Yield estimated
Sec. 25, T. 101, R. 60	.....	2	35	Yield estimated
Sec. 32, T. 101, R. 60	.....	2	40	Yield estimated
Sec. 33, T. 101, R. 60	.....	2	40	Yield estimated
Sec. 34, T. 101, R. 60	.....	2	45	Yeild estimated
Sec. 34, T. 101, R. 60	.....	2	45	Yeild estimated
Sec. 35, T. 101, R. 60	.....	2	45	Yeild estimated
Sec. 1, T. 101, R. 61	.....	1¼	15	Yield estimated
Sec. 2, T. 101, R. 61	.....	1¼	15	Yield estimated
Sec. 2, T. 101, R. 61	.....	1¼	15	Yield estimated
Sec. 3, T. 101, R. 61	.....	1¼	20	Yield estimated
Sec. 4, T. 101, R. 61	.....	1¼	20	Yield estimated
Sec. 5, T. 101, R. 61	.....	1¼	15	Yield estimated
Sec. 10, T. 101, R. 61	.....	1¼	15	Yield estimated
Sec. 11, T. 101, R. 61	.....	1¼	20	Yield estimated
Sec. 12, T. 101, R. 61	.....	1¼	20	Yield estimated
Sec. 13, T. 101, R. 61	.....	1¼	25	Yield estimated
Sec. 13, T. 101, R. 61	.....	1¼	25	Yield estimated
Sec. 13, T. 101, R. 61	.....	1¼	25	Yield estimated
Sec. 13, T. 101, R. 61	.....	1¼	25	Yield estimated
Sec. 15, T. 101, R. 61	.....	2	30	Yield estimated
Sec. 19, T. 101, R. 61	.....	2	30	Yield estimated
Sec. 19, T. 101, R. 61	.....	2	30	Yield estimated
Sec. 20, T. 101, R. 61	.....	2	35	Yield estimated
Sec. 21, T. 101, R. 61	.....	2	35	Yield estimated
Sec. 23, T. 101, R. 61	.....	2	40	Yield estimated
Sec. 23, T. 101, R. 61	.....	2	40	Yield estimated
Sec. 24, T. 101, R. 61	.....	2	40	Yield estimated
Sec. 25, T. 101, R. 61	.....	2	45	Yield estimated
Sec. 25, T. 101, R. 61	.....	2	45	Yield estimated
Sec. 27, T. 101, R. 61	.....	2	45	Yield estimated
Sec. 27, T. 101, R. 61	.....	2	45	Yield estimated
Sec. 28, T. 101, R. 61	.....	2	48	Yield estimated
Sec. 29, T. 101, R. 61	.....	2	48	Yield estimated
Sec. 32, T. 101, R. 61	.....	2	48	Yield estimated
Sec. 2, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 3, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 6, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 12, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 14, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 14, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 22, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 26, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 26, T. 101, R. 62	.....	.....	60	Yield estimated
Sec. 31, T. 102, R. 60	.....	.....	15	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Davison County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 2, T. 102, R. 61	.....	.....	5	Yield estimated
Sec. 3, T. 102, R. 61	.....	.....	5	Yield estimated
Sec. 5, T. 102, R. 61	.....	.....	5	Yield estimated
Sec. 6, T. 102, R. 61	.....	.....	4	Yield estimated
Sec. 9, T. 102, R. 61	.....	.....	1	Yield estimated
Sec. 14, T. 102, R. 61	.....	.....	2	Yield estimated
Sec. 22, T. 102, R. 61	.....	.....	5	Yield estimated
Sec. 23, T. 102, R. 61	.....	.....	2	Yield estimated
Sec. 25, T. 102, R. 61	.....	.....	3	Yield estimated
Sec. 27, T. 102, R. 61	.....	.....	3	Yield estimated
Sec. 31, T. 102, R. 61	.....	.....	2	Yield estimated
Sec. 34, T. 102, R. 61	.....	.....	1	Yield estimated
Sec. 3, T. 102, R. 62	160	4½	10	Yield estimated
Sec. 8, T. 102, R. 62	.....	.....	15	Yield estimated
Sec. 9, T. 102, R. 62	.....	.....	5	Yield estimated
Sec. 11, T. 102, R. 62	.....	.....	5	Yield estimated
Sec. 14, T. 102, R. 62	.....	.....	5	Yield estimated
Sec. 15, T. 102, R. 62	.....	.....	10	Yield estimated
Sec. 15, T. 102, R. 62	.....	.....	10	Yield estimated
Sec. 18, T. 102, R. 62	.....	.....	10	Yield estimated
Sec. 19, T. 102, R. 62	.....	.....	10	Yield estimated
Sec. 20, T. 102, R. 62	.....	.....	10	Yield estimated
Sec. 25, T. 102, R. 62	.....	.....	10	Yield estimated
Sec. 27, T. 102, R. 62	.....	.....	10	Yield estimated
Sec. 29, T. 102, R. 62	.....	.....	5	Yield estimated
Sec. 31, T. 102, R. 62	.....	.....	5	Yield estimated
Sec. 34, T. 102, R. 62	.....	.....	5	Yield estimated
Sec. 8, T. 102, R. 60	765	.....	40	Yield estimated
T. 103, R. 60	330–550	.....	35	Pressure 13 lbs.
T. 103, R. 60	586	8	250	Pressure 28 lbs.
T. 103, R. 60	548	.....	60	Pressure 7 lbs.
T. 103, R. 60	433	2	20	
T. 103, R. 60	472	2	40	
Sec. 1, T. 103, R. 61	.....	.....	5	Yield estimated
Sec. 5, T. 103, R. 61	.....	.....	5	Yield estimated
Sec. 6, E. 103, R. 61	.....	.....	5	Yield estimated
Sec. 7, T. 103, R. 61	.....	.....	2	Yield estimated
Sec. 8, T. 103, R. 61	.....	.....	3	Yield estimated
Sec. 9, T. 103, R. 61	.....	.....	1	Yield estimated
Sec. 13, T. 103, R. 61	.....	.....	1	Yield estimated
Sec. 14, T. 103, R. 61	.....	.....	1	Yield estimated
Sec. 17, T. 103, R. 61	.....	.....	1	Yield estimated
Sec. 17, T. 103, R. 61	.....	.....	1	Yield estimated
Sec. 18, T. 103, R. 61	.....	.....	4	Yield estimated
Sec. 18, T. 103, R. 61	.....	.....	4	Yield estimated
Sec. 21, T. 103, R. 61	.....	.....	3	Yield estimated
Sec. 22, T. 103, R. 61	.....	.....	3	Yield estimated
Sec. 22, T. 103, R. 61	.....	.....	3	Yield estimated
Sec. 28, T. 103, R. 61	.....	.....	2	Yield estimated
Sec. 29, T. 103, R. 61	.....	.....	2	Yield estimated
Sec. 30, T. 103, R. 61	.....	.....	2	Yield estimated
Sec. 30, T. 103, R. 61	.....	.....	2	Yield estimated
Sec. 2, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 3, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 4, T. 103, R. 62	495	4½	30	
Sec. 9, T. 103, R. 62	.....	4½	50	Yield estimated
Sec. 9, T. 103, R. 62	.....	4½	50	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Davison County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 10, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 10, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 11, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 11, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 12, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 12, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 14, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 15, T. 103, R. 62	337	4½	32	Yield estimated
Sec. 11, T. 103, R. 62	.....	3½	30	Yield estimated
Sec. 17, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 17, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 20, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 21, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 21, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 21, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 22, T. 103, R. 62	350	3½–2½	100	Yield estimated
Sec. 23, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 24, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 26, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 26, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 27, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 28, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 30, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 31, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 31, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 31, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 32, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 33, T. 103, R. 62	.....	3½	50	Yield estimated
Sec. 4, T. 104, R. 60	.....	2	25	Yield estimated
Sec. 5, T. 104, R. 60	.....	2	30	Yield estimated
Sec. 5, T. 104, R. 60	.....	2	35	Yield estimated
Sec. 7, T. 104, R. 60	400	2	21	
Sec. 7, T. 104, R. 60	.....	2	20	Yield estimated
Sec. 7, T. 104, R. 60	.....	2	20	Yield estimated
Sec. 8, T. 104, R. 60	.....	2	15	Yield estimated
Sec. 9, T. 104, R. 60	300	2	50	Yield estimated
Sec. 9, T. 104, R. 60	.....	2	50	Yield estimated
Sec. 10, T. 104, R. 60	.....	2	50	Yield estimated
Sec. 11, T. 104, R. 60	.....	2	45	Yield estimated
Sec. 12, T. 104, R. 60	250	2	3	Yield estimated
Sec. 13, T. 104, R. 60	.....	2	5	Yield estimated
Sec. 14, T. 104, R. 60	.....	2	5	Yield estimated
Sec. 17, T. 104, R. 60	400	.....	100	
Sec. 17, T. 104, R. 60	.....	2	75	Yield estimated
Sec. 17, T. 104, R. 60	.....	2	50	Yield estimated
Sec. 18, T. 104, R. 60	.....	2	25	Yield estimated
Sec. 18, T. 104, R. 60	.....	2	30	Yield estimated
Sec. 19, T. 104, R. 60	.....	2	45	Yield estimated
Sec. 20, T. 104, R. 60	.....	2	30	Yield estimated
Sec. 21, T. 104, R. 60	.....	2	40	Yield estimated
Sec. 23, T. 104, R. 60	260	4	2	
Sec. 24, T. 104, R. 60	104	2	2	
Sec. 24, T. 104, R. 60	200	2	50	
Sec. 25, T. 104, R. 60	317	2	2	
Sec. 25, T. 104, R. 60	116	2	4	
Sec. 26, T. 104, R. 60	230	2	10	
Sec. 26, T. 104, R. 60	288	2	1	

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Davison County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 30, T. 104, R. 60	.....	2	10	Yield estimated
Sec. 35, T. 104, R. 60	507	4½-3	40	
Sec. 1, T. 104, R. 61	.....	2	60	Yield estimated
Sec. 1, T. 104, R. 61	.....	2	40	Yield estimated
Sec. 6, T. 104, R. 61	.....	2	50	Yield estimated
Sec. 8, T. 104, R. 61	.....	2	45	Yield estimated
Sec. 9, T. 104, R. 61	.....	2	45	Yield estimated
Sec. 9, T. 104, R. 61	.....	2	45	Yield estimated
Sec. 8, T. 104, R. 61	.....	2	50	Yield estimated
Sec. 9, T. 104, R. 61	.....	2	50	Yield estimated
Sec. 12, T. 104, R. 61	410	2	40	
Sec. 13, T. 104, R. 61	358	2	200	Yield estimated
Sec. 15, T. 104, R. 61	350	2	200	Yield estimated
Sec. 15, T. 104, R. 61	.....	2	200	Yield estimated
Sec. 18, T. 104, R. 61	.....	2	100	Yield estimated
Sec. 18, T. 104, R. 61	.....	2	75	Yield estimated
Sec. 19, T. 104, R. 61	.....	2	50	Yield estimated
Sec. 20, T. 104, R. 61	.....	2	60	Yield estimated
Sec. 21, T. 104, R. 61	.....	2	50	Yield estimated
Sec. 22, T. 104, R. 61	.....	2	75	Yield estimated
Sec. 22, T. 104, R. 61	.....	2	75	Yield estimated
Sec. 23, T. 104, R. 61	.....	2	50	Yield estimated
Sec. 23, T. 104, R. 61	.....	2	50	Yield estimated
Sec. 25, T. 104, R. 61	.....	2	60	Yield estimated
Sec. 25, T. 104, R. 61	.....	2	50	Yield estimated
Sec. 26, T. 104, R. 61	.....	2	60	Yield estimated
Sec. 26, T. 104, R. 61	.....	2	40	Yield estimated
Sec. 27, T. 104, R. 61	295	3	450	Pressure 95 lbs.
Sec. 27, T. 104, R. 61	.....	3	200	Yield estimated
Sec. 28, T. 104, R. 61	.....	2	100	Yield estimated
Sec. 28, T. 104, R. 61	.....	2	75	Yield estimated
Sec. 29, T. 104, R. 61	.....	2	100	Yield estimated
Sec. 30, T. 104, R. 61	.....	2	100	Yield estimated
Sec. 31, T. 104, R. 61	.....	2	75	Yield estimated
Sec. 33, T. 104, R. 61	.....	2	75	Yield estimated
Sec. 34, T. 104, R. 61	.....	2	60	Yield estimated
Sec. 35, T. 104, R. 61	.....	2	65	Yield estimated
Sec. 1, T. 104, R. 62	.....	3	100	Yield estimated
Sec. 2, T. 104, R. 62	.....	3	100	Yield estimated
Sec. 2, T. 104, R. 62	.....	3	50	Yield estimated
Sec. 4, T. 104, R. 62	.....	3	75	Yield estimated
Sec. 5, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 7, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 7, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 8, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 8, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 9, T. 104, R. 62	.....	3	50	Yield estimated
Sec. 9, T. 104, R. 62	.....	3	50	Yield estimated
Sec. 9, T. 104, R. 62	.....	3	50	Yield estimated
Sec. 11, T. 104, R. 62	.....	3	55	Yield estimated
Sec. 17, T. 104, R. 62	.....	3	55	Yield estimated
Sec. 17, T. 104, R. 62	.....	3	40	Yield estimated
Sec. 17, T. 104, R. 62	.....	3	40	Yield estimated
Sec. 18, T. 104, R. 62	.....	3	50	Yield estimated
Sec. 19, T. 104, R. 62	.....	3	100	Yield estimated
Sec. 20, T. 104, R. 62	.....	3	100	Yield estimated
Sec. 20, T. 104, R. 62	.....	3	75	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Davison County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 21, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 21, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 22, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 23, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 25, T. 104, R. 62	.....	3	60	Yield estimated
Sec. 26, T. 104, R. 62	338	4–3	450	Pressure 92 to 100 lbs.
Sec. 26, T. 104, R. 62	.....	3	300	Yield estimated
Sec. 27, T. 104, R. 62	.....	3	250	Yield estimated
Sec. 28, T. 104, R. 62	.....	3	100	Yield estimated
Sec. 28, T. 104, R. 62	.....	3	150	Yield estimated
Sec. 29, T. 104, R. 62	.....	3	200	Yield estimated
Sec. 32, T. 104, R. 62	.....	3	175	Yield estimated
Sec. 34, T. 104, R. 62	.....	3	150	Yield estimated
Sec. 34, T. 104, R. 62	.....	3	150	Yield estimated

Total yield, 11,754 gallons per minute.
Total number of wells, 242.

Day County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Andover	1075	6½	300	Pressure 90 lbs.
Webster	1716	.....	69	
Webster	1550	2	.....	Unsuccessful
T. 122, R. 59	1080	1¼	40	Pressure 85 lbs.
T. 123, R. 58	1240	3	10	
T. 124, R. 58	1240	.....	5	Water just flows
Sec. 6, T. 124, R. 58	930	1¼	28	Pressure 70 lbs.
T. 124, R. 58	1200	1¼	15	Pressure 40 lbs.
Sec. 2, T. 124, R. 59	930	1¼	40	Pressure 75 lbs.
Sec. 36, T. 124, R. 59	970	1¼	35	Pressure 90 lbs.

Total yield, 542 gallons per minute.
Total number of wells, 10.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Douglas County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Delmont	821	2	60	
City of Armour	757	6	1500	Pressure 55 lbs.
Sec. 20, T. 98, R. 63	722	1¼	500	Pressure 64 lbs.
Armour Mill Company	800	8	1500	
Sec. 2, T. 98, R. 64	901	8–6	1200	
Sec. 24, T. 98, R. 64	736	2	20	
Sec. 2, T. 98, R. 65	860	6	900	
Sec. 35, T. 99, R. 63	703	8–6	2100	Pressure 75 lbs.
Sec. 14, T. 99, R. 65	925	4	600–700	
T. 99, R. 65	1010	6	1000	
Sec. 16, T. 100, R. 62	600	2	100	Yield estimated
Sec. 18, T. 100, R. 62	1025	.....	1025	
Flensburg	611	2	60	
Flensburg, ½ mile west	651	2	.....	
Flensburg, ¼ mile west	775	2	65–70	
Sec. 15, T. 100, R. 63	750	4	600–700	
Sec. 26, T. 100, R. 64	937	6	900	Pressure 40 lbs.
Sec. 26, T. 100, R. 64	975	4	1000	
Sec. 9, T. 100, R. 65	80	12	50	
T. 100, R. 65	685	2–1	1	

Total yield, 13,386 gallons per minute.

Total number of wells, 20.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Edmunds County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Ipswich	1265	3	150	Pressure 85 to 120 lbs.
T. 121, R. 66	987–1100	1¼–2	12–35	
T. 120, R. 67	1141	1¼	25	
T. 121, R. 67	1025–1155	1¼	20–50	
T. 121, R. 68	1155–1250	1¼–3	40–50	
T. 121, R. 69	1240	1¼	25	
T. 121, R. 70	1300–1370	1¼	35	
T. 121, R. 71	1500–1569	1¼	20	
T. 122, R. 66	1000–1087	1¼–2	15–70	
T. 122, R. 67	1000–1140	1¼	5–35	
T. 122, R. 68	1145–1170	1¼	20–35	
T. 122, R. 69	1305–1360	1¼	35–70	
T. 122, R. 71	1526	1¼	2	
T. 123, R. 66	1075–1115	2–1¼	25	
T. 123, R. 67	1160	1¼	35	
T. 123, R. 68	1195–1245	2–3	97–150	
T. 123, R. 69	1370–1420	1¼	30	
T. 123, R. 70	1498	2	3½	
T. 124, R. 66	1125–1148	1¼	40–41	
T. 124, R. 67	1150–1175	1¼–2	35–120	
T. 124, R. 68	1225–1350	1¼	25–45	
T. 124, R. 69	1356	2	60	
373 additional wells, location not designated	.....	.....	4000	Yield estimated

Total yield, 5,211 gallons per minute.
Total number of wells, 395.

Fall River County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Edgmont	2980	4	400	Pressure 75 lbs.
Argentine	550	.....	100	Yield estimated
Hot Springs	223	.....	40	Yield estimated

Total yield, 540 gallons per minute.
Total number of wells, 3.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Faulk County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 116, R. 66	970	1¼	30	
T. 117, R. 66	913–1054	1¼	45–65	
T. 117, R. 67	1000–997	1¼	48–27	
T. 117, R. 68	1095–1156	1¼–2	75–90	
T. 117, R. 69	1232	.....	60	Pressure 25 to 34 lbs.
T. 117, R. 69	1215	6–5¼	950	
T. 117, R. 70	1552	3–1¼	17	
T. 118, R. 66	938–1041	1¼	35–55	
T. 118, R. 67	1016–1075	1¼–2	60–75	
T. 118, R. 68	1030–1185	1¼	20–45	
T. 118, R. 69	1220–1466	1¼–4	25–40	Pressure 60 lbs.
T. 118, R. 70	1183–1608	2–3	45–100	
T. 119, R. 66	970–1008	1¼–2	35–68	
T. 119, R. 67	1030–1172	1¼	20–160	
T. 119, R. 68	1110–1165	1¼–2	30–150	
T. 119, R. 69	1206–1456	2–3	25–100	
T. 119, R. 70	1367–1402	2	100–185	
T. 119, R. 71	1545	2	45	
T. 120, R. 67	1039–1060	1¼–3	50–150	
T. 120, R. 68	1025–1125	1¼	25	Pressure 85 lbs.
T. 120, R. 69	1197–1287	1¼–2	10–125	
T. 120, R. 70	1342–1512	1¼–2	12–100	
T. 120, R. 71	1505–1570	2–3	27–35	
T. 120, R. 72	1580–1650	2	30–70	

Total yield, 2,767 gallons per minute.
Total number of wells, 24

Grant County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
SW¼ Sec. 30, T. 118, R. 47	155	2	65	
SW¼ Sec. 14, T. 118, R. 48	57	1–2	40	
Milbank	303	.....	10	
NE¼ Sec. 9, T. 118, R. 48	206	3	3	
NE¼ Sec. 22, T. 120, R. 48	407	2	.2	Pressure 16 lbs.
SE¼ Sec. 18, T. 120, R. 49	422	2	10	Pressure 7 lbs.
NW¼ Sec. 7, T. 120, R. 49	510	2	.30	Pressure 13 lbs.
NE¼ Sec. 11, T. 120, R. 49	379	2	½	
NE¼ Sec. 13, T. 120, R. 49	459	2	45	Pressure 17 lbs.

Total yield, 205 gallons per minute.
Total number of wells, 9.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Gregory County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Fort Randall	610	4	600	
Sec. 4, T. 95, R. 67	761	1¼	30	
Sec. 36, T. 96, R. 67	605	2	70	
Sec. 26, T. 96, R. 67	505	1½	15	
Sec. 16, T. 96, R. 67	569	1¼	15	
Sec. 27, T. 96, R. 67	740	2½	15	
Sec. 33, T. 96, R. 67	740	1¼	15	
Sec. 35, T. 96, R. 67	750	2	26	
Sec. 33, T. 97, R. 68	800	4	100	Yield estimated
Sec. 29, T. 97, R. 68	730	6	200	Yield estimated
Sec. 30, T. 97, R. 68	714	6	150	Yield estimated
Sec. 30, T. 97, R. 68	829	3	50	Yield estimated
Sec. 30, T. 97, R. 68	730	3	5	
Sec. 30, T. 97, R. 68	750	2	5	
Sec. 16, T. 97, R. 68	800	2½	10	Yield estimated
Sec. 21, T. 97, R. 68	735	4	20	Yield estimated
Sec. 4, T. 97, R. 68	762	2	10	Yield estimated
Sec. 7, T. 97, R. 69	865	4	20	
Sec. 35, T. 97, R. 69	912	6	167	
Sec. 33, T. 97, R. 69	920	6	150	
Sec. 25, T. 97, R. 70	800	4½	1	
Sec. 25, T. 97, R. 70	900	3	1	
Sec. 2, T. 98, R. 70	414	4	1	
Sec. 17, T. 99, R. 70	464	1¼	1	
Sec. 17, T. 99, R. 70	650	2	1	
Sec. 34, T. 99, R. 70	640	1¼	1	
Sec. 8, T. 99, R. 70	659	2	1	

Total yield, 1,680 gallons per minute.
Total number of wells, 27.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Hand County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 7, T. 110, R. 67	1474	3–2	10	Yield estimated
Sec. 21, T. 110, R. 68	1611	2	.....	
Sec. 28, T. 110, R. 68	838	1¼	50	
Sec. 1, T. 111, R. 66	931	1¼	41	
Sec. 8, T. 111, R. 66	.....	1¼	10	Yield estimated
Sec. 30, T. 112, R. 66	1269	2–1¼	40	
Sec. 4, T. 112, R. 67	1125	1¼	50	
Sec. 5, T. 112, R. 67	1165	2–1¼	14	
Sec. 7, T. 112, R. 67	1272	.....	10	Yield estimated
Sec. 18, T. 112, R. 67	1343	3	350	Pressure 40 lbs.
Sec. 26, T. 112, R. 67	1246	.....	40	
Sec. 33, T. 112, R. 67	1375	3	1350	Pressure 119 lbs.
Sec. 2, T. 112, R. 68	1158	1¼	135	
Sec. 7, T. 112, R. 68	1200	4	50	
Sec. 10, T. 112, R. 68	1140	3½	100	Yield estimated
Sec. 10, T. 112, R. 68	1139	6¼–4½	360	Pressure 120 lbs.
Sec. 10, T. 112, R. 68	1142	3–2	40	
Sec. 9, T. 112, R. 69	1300	1¼	30	
Sec. 11, T. 112, R. 69	1207	2	100	Pressure 60 lbs.
Sec. 5, T. 112, R. 70	1400	2	20	
T. 112, R. 70	1440	1¼	30	
Sec. 11, T. 113, R. 66	980	2	100	Pressure 8 lbs.
Sec. 15, T. 113, R. 66	967	1¼	35	
Sec. 18, T. 113, R. 66	1163	1¼	40	
Sec. 20, T. 113, R. 66	1058	1¼	35	
Sec. 24, T. 113, R. 66	980	1¼	35	
Sec. 24, T. 113, R. 66	1002	1¼	50	
Sec. 14, T. 113, R. 67	1155	2½	100	Yield estimated
Sec. 15, T. 113, R. 67	800	2	50	Yield estimated
Sec. 25, T. 113, R. 67	1137	.....	30	Yield estimated
Sec. 25, T. 113, R. 67	1140	3	400	Pressure 128 lbs.
Sec. 25, T. 113, R. 67	1168	1¼	35	
Sec. 29, T. 113, R. 68	1125	3	100	Yield estimated
Sec. 13, T. 113, R. 69	1162	2	100	
Sec. 14, T. 113, R. 69	1215	2	50	Yield estimated
T. 113, R. 69	1200	.....	50	Yield estimated
Sec. 33, T. 113, R. 69	1214	1¼	60	
Sec. 1, T. 113, R. 70	1228	2	150	
T. 113, R. 70	1250	2	30	
Sec. 9, T. 114, R. 66	966	2	50	
Sec. 11, T. 114, R. 66	1070	1¼	35	
Sec. 12, T. 114, R. 66	1011	1¼	35	
Sec. 14, T. 114, R. 66	960	1¼	40	
Sec. 22, T. 114, R. 66	958	1¼	42	
Sec. 35, T. 114, R. 66	1010	1¼	35	
Sec. 30, T. 114, R. 67	1102	1¼	25	
Sec. 8, T. 114, R. 68	1170	1¼	35	
Sec. 9, T. 114, R. 68	1185	1¼	30	
Sec. 12, T. 114, R. 68	1050	1¼	40	
Sec. 19, T. 114, R. 68	1140	1¼	35	
Sec. 27, T. 114, R. 68	1272	.....	40	Yield estimated
T. 114, R. 69	1338	.....	25	
Sec. 14, T. 114, R. 69	1197	2	50	
Sec. 2, T. 114, R. 70	1270	2	80	
Sec. 8, T. 114, R. 70	1380	2	120	
Sec. 15, T. 114, R. 70	1303	3–1¼	15–25	
Sec. 19, T. 114, R. 70	1305	1¼	55	

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Hand County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 20, T. 114, R. 70	1350	2	120	
T. 114, R. 70	.....	3	100	Yield estimated
Sec. 35, T. 115, R. 66	993	1¼	40	Yield estimated
Sec. 12, T. 115, R. 67	1015	1¼	30	Yield estimated
Sec. 10, T. 115, R. 68	1182	1¼	40	Yield estimated
Sec. 20, T. 115, R. 68	1400	4½–2	180	
Sec. 22, T. 115, R. 68	1065	1¼	60	
Sec. 10, T. 115, R. 69	.....	2	40	Yield estimated
Sec. 14, T. 115, R. 69	1335	1¼	35	
Sec. 24, T. 115, R. 69	1242	.....	16	
Sec. 14, T. 115, R. 70	1370	2	135	
Sec. 28, T. 115, R. 70	1300	2	100	
Sec. 15, T. 116, R. 67	966	1¼	35	
Sec. 26, T. 116, R. 67	853	1¼	30	Yield estimated
Sec. 28, T. 116, R. 68	1115	1¼	68	
Sec. 35, T. 116, R. 69	1260	1¼	40	

Total yield, 6,146 gallons per minute.
Total number of wells, 73.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Hanson County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 101, R. 58	412	.....	30	Yield estimated
T. 103, R. 56	112–150	.....	10	Yield estimated
Sec. 11, T. 103, R. 57	153	3	10	Yield estimated
Sec. 12, T. 103, R. 57	200	2	40	
T. 103, R. 58	140	.....	10	Yield estimated
T. 103, R. 59	135–176	.....	10	Yield estimated
T. 103, R. 59	400–470	.....	30	Yield estimated
T. 103, R. 59	356	.....	20	Yield estimated
T. 104, R. 56	80–145	.....	10	Yield estimated
T. 104, R. 56	167–260	.....	10	Yield estimated
Sec. 3, T. 104, R. 57	320	2	2	
Sec. 7, T. 104, R. 57	212	2	½	
Sec. 8, T. 104, R. 57	589	2–1¼	50	
Sec. 8, T. 104, R. 57	600	1¼	20	
Sec. 12, T. 104, R. 58	483	2	12	
Sec. 13, T. 104, R. 57	175	2	10	Yield estimated
Sec. 17, T. 104, R. 57	510	3	2	
Sec. 21, T. 104, R. 57	550	2	2	
Sec. 22, T. 104, R. 57	543	2	50	
Sec. 24, T. 104, R. 57	555	2	1	
Sec. 27, T. 104, R. 57	508	2	4	
Sec. 30, T. 104, R. 57	365	2	5	
Sec. 30, T. 104, R. 57	235	2	⅓	
Sec. 1, T. 104, R. 58	275	3	6	
Sec. 2, T. 104, R. 58	350	2	7	
Sec. 9, T. 104, R. 58	535	2	5	
Sec. 12, T. 104, R. 58	485	4	35	
Sec. 13, T. 104, R. 58	550	2	150	
Sec. 14, T. 104, R. 58	528	2–1¼	30	
Sec. 17, T. 104, R. 58	.....	.....	5	Yield estimated
Sec. 22, T. 104, R. 58	207	.....	100	Yield estimated
Sec. 23, T. 104, R. 58	320	2	½	
Sec. 24, T. 104, R. 58	300	2	1½	
Sec. 25, T. 104, R. 58	270	2	3	
Sec. 4, T. 104, R. 59	156	.....	6	Yield estimated
Sec. 6, T. 104, R. 59	180	2	3	
Sec. 7, T. 104, R. 59	186	2	½	
Sec. 8, T. 104, R. 59	124	2	6	Yield estimated
Sec. 8, T. 104, R. 59	120	2	6	Yield estimated
Sec. 11, T. 104, R. 59	200	2	10	
Sec. 12, T. 104, R. 59	246	1¼	10	Yield estimated
Sec. 17, T. 104, R. 59	128	2	8	Yield estimated
Sec. 17, T. 104, R. 59	85	2	5	
Sec. 18, T. 104, R. 59	170	2¼	1	
Sec. 19, T. 104, R. 59	10	2	1	
Sec. 19, T. 104, R. 59	117	2	2	Yield estimated
Sec. 21, T. 104, R. 59	116	½	1–6	
Sec. 23, T. 104, R. 59	97	2	5	
Sec. 31, T. 104, R. 59	155	2	6	

Total yield, 757 gallons per minute.
Total number of wells, 49.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Hughes County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Pierre, Locke Hotel	1160	4	600	Yield estimated
Pierre, mill	.....	2	100	Yield estimated
Pierre	1256	7	1500	Yield estimated
Pierre	1537	8	1500	Yield estimated
Pierre	.....	.....	1500	
Pierre	.....	.....	500	Yield estimated
Pierre	.....	.....	500	Yield estimated
Pierre, capitol grounds	1350	6	1620	
Indian School	.....	.....	1500	
Harrold	1453	4	84	
Blunt	.....	.....	60	Yield estimated
T. 112, R. 78	.....	2	50	
T. 111, R. 77	.....	2	50	
T. 112, R. 76	.....	2	50	
T. 112, R. 76	.....	2	50	
T. 112, R. 76	.....	2	50	
T. 111, R. 79	.....	2	50	
T. 110, R. 75	.....	2	50	Yield estimated
T. 110, R. 75	.....	2	50	Yield estimated
T. 110, R. 76	.....	2	50	Yield estimated

Total yield, 9,914 gallons per minute.
Total number of wells, 20.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Hutchinson County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 97, R. 56	445–480	2	.....	No flow
T. 97, R. 56	122	2	27–60	
T. 97, R. 57	65–154	1¼–2	3–10	
T. 97, R. 57	417	1¼–2	5	
T. 97, R. 57	406–630	1¼–2	50	Pressure 25 lbs.
T. 97, R. 57	747	1¼–2	6	
T. 97, R. 59	480–620	1¼–2	30–50	Pressure 25 to 35 lbs.
T. 97, R. 59	300	1¼–2	5	
Sec. 26, T. 97, R. 59	500	1¼–2	1	
T. 97, R. 60	540–614	1¼–2	40–50	
T. 97, R. 60	648–760	1¼–2	50–100	Pressure 35 to 60 lbs.
T. 97, R. 60	824	4½	700	Pressure 9 lbs.
T. 97, R. 61	30–62	.....	6	
T. 97, R. 61	945	.....	10	Yield estimated
T. 98, R. 56	53–54	.....	4–9	
T. 98, R. 57	55–65	.....	1–3	
T. 98, R. 58	420	.....	15	Yield estimated
T. 98, R. 59	40–200	1¼–2	15	Yield estimated
T. 98, R. 59	370–450	1¼–2	1–15	
T. 98, R. 60	470–580	2–5	16–120	
T. 98, R. 60	120–189	2–5	15	Yield estimated
T. 98, R. 61	482–560	1¼–3	3–60	
T. 98, R. 61	64–130	1¼–3	6–10	
T. 99, R. 56	54–95	.....	10–12	
T. 99, R. 57	150	.....	10	Yield estimated
T. 99, R. 58	270–335	.....	1–10	
T. 99, R. 58	280	.....	.....	No flow
T. 99, R. 59	369–490	2	20	Yield estimated
T. 99, R. 59	118	2	20	Yield estimated
T. 99, R. 60	470–540	1¼–3	5–150	
T. 99, R. 60	100–130	1¼–3	30	Yield estimated
T. 99, R. 60	360–440	1¼–3	30	Yield estimated
T. 99, R. 60	542	3	30	Pressure 20 lbs.
T. 99, R. 61	515–535	1¼–2	10–50	Pressure 13 lbs.
T. 99, R. 61	140	1¼–2	10	Yield estimated
T. 99, R. 61	490–572	1¼–2	8–50	
T. 100, R. 59	180–220	.....	20	Yield estimated
T. 100, R. 59	240–345	.....	.....	No flow
T. 100, R. 60	560	2	10	
T. 100, R. 60	370–462	2	3–10	
T. 100, R. 60	296–340	2	30	Yield estimated
T. 100, R. 61	419–585	2–3	1–90	

Total yield, 1,897 gallons per minute.
Total number of wells, 42.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Hyde County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 30, T. 110, R. 73	.....	.....	10	Yield estimated
Sec. 11, T. 111, R. 72	.....	.....	20	Yield estimated
Sec. 1, T. 111, R. 72	.....	.....	10	Yield estimated
Sec. 2, T. 112, R. 71	.....	.....	20	Yield estimated
Sec. 10, T. 112, R. 71	.....	.....	10	Yield estimated
Sec. 3, T. 112, R. 72	.....	.....	10	Yield estimated
Sec. 4, T. 112, R. 72	.....	.....	20	Yield estimated
Sec. 4, T. 112, R. 72	.....	.....	20	Yield estimated
Sec. 5, T. 112, R. 72	1440	2	100	Yield estimated
Sec. 2, T. 112, R. 72	1631	3	14	Yield estimated
T. 112, R. 72, Highmore	1552	6	9	Pressure 12 to 15 lbs.
Sec. 14, T. 112, R. 73	.....	.....	10	Yield estimated
Sec. 2, T. 113, R. 71	.....	.....	20	Yield estimated
Sec. 1, T. 113, R. 71	1350	2	18	Yield estimated
Sec. 6, T. 113, R. 71	.....	.....	20	Yield estimated
Sec. 13, T. 113, R. 71	1397	3–2	70	Yield estimated
Sec. --, T. 113, R. 71	.....	.....	20	Yield estimated
Sec. 19, T. 113, R. 71	.....	.....	20	Yield estimated
Sec. 20, T. 113, R. 71	1490	2	120	Yield estimated
Sec. 24, T. 113, R. 71	.....	.....	10	Yield estimated
Sec. 27, T. 113, R. 71	.....	.....	10	Yield estimated
Sec. 33, T. 113, R. 71	.....	.....	10	Yield estimated
Sec. 34, T. 113, R. 71	1590	2	10	Yield estimated
Sec. 34, T. 113, R. 72	1487	2	12	Yield estimated
Sec. 25, T. 113, R. 72	.....	.....	120	Yield estimated
Sec. 20, T. 113, R. 72	.....	.....	20	Yield estimated
Sec. 14, T. 113, R. 72	.....	.....	20	Yield estimated
Sec. 1, T. 113, R. 72	.....	.....	10	Yield estimated
Sec. 9, T. 113, R. 73	.....	.....	20	Yield estimated
Sec. 8, T. 113, R. 73	.....	.....	10	Yield estimated
Sec. 3, T. 113, R. 73	.....	.....	10	Yield estimated
Sec. 1, T. 113, R. 73	.....	.....	20	Yield estimated
Sec. 3, T. 114, R. 71	1360	1¼	25	Yield estimated
Sec. 4, T. 114, R. 71	1445	2–1¼	10	Yitld estimated
Sec. 7, T. 114, R. 71	1396	1¼	34	Yield estimated
Sec. 10, T. 114, R. 71	1370	1¼	30	Yield estimated
Sec. 14, T. 114, R. 71	.....	.....	20	Yield estimated
Sec. 22, T. 114, R. 71	.....	.....	20	Yield estimated
Sec. 24, T. 114, R. 71	.....	.....	20	Yield estimated
Sec. 29, T. 114, R. 71	1397	3–2	70	
Sec. 28, T. 114, R. 71	.....	.....	20	Yield estimated
Sec. 30, T. 114, R. 71	1380	.....	30	Pressure 30 lbs.
Sec. 34, T. 114, R. 71	1370	2	18	Yield estimated
Sec. 2, T. 114, R. 72	.....	.....	10	Yield estimated
Sec. 3, T. 114, R. 72	.....	.....	10	Yield estimated
Sec. 13, T. 114, R. 72	.....	.....	20	Yield estimated
Sec. 35, T. 114, R. 72	.....	.....	150	Yield estimated
Sec. 19, T. 114, R. 73	1508	2	20	Yield estimated
Sec. 24, T. 114, R. 73	.....	.....	10	Yield estimated
Sec. 28, T. 114, R. 73	.....	.....	10	Yield estimated
Sec. 29, T. 114, R. 73	.....	.....	20	Yield estimated
Sec. 27, T. 115, R. 71	.....	.....	20	Yield estimated
Sec. 26, T. 115, R. 71	.....	.....	10	Yield estimated
Sec. 22, T. 115, R. 71	.....	.....	10	Yield estimated
Sec. 13, T. 115, R. 71	.....	.....	10	Yield estimated
Sec. 9, T. 115, R. 71	.....	.....	20	Yield estimated
Sec. 10, T. 115, R. 71	.....	.....	20	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Hyde County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 19, T. 115, R. 72	.....	.....	10	Yield estimated
Sec. 11, T. 115, R. 72	.....	.....	10	Yield estimated
Sec. 14, T. 115, R. 73	.....	.....	20	Yield estimated
Sec. 25, T. 116, R. 73	.....	.....	20	Yield estimated

Total yield, 1,520 gallons per minute.
Total number of wells, 61.

Jerauld County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 2, T. 106, R. 63	715	2	200	Pressure 132 lbs.
Sec. 6, T. 106, R. 63	760	3–2	280	Pressure 110 lbs.
Sec. 9, T. 106, R. 64	880	2½	280	Pressure 114 lbs.
Sec. 15, T. 106, R. 64	816	3	10	
Sec. 17, T. 106, R. 64	810	2½	5	
T. 107, R. 64	860	1¼	35	
T. 107, R. 65	1200	4	1	
T. 108, R. 63	785	3	500	
Sec. 11, T. 108, R. 64	799½	2–1¼	2	
T. 108, R. 64	840–865	2–1¼	45	
Sec. 5, T. 108, R. 65	1057	2½	200	Pressure 90 lbs.

Total yield, 1,558 gallons per minute.
Total number of wells, 11.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Kingsbury County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 30, T. 109, R. 57	925	2	80	Pressure 20 lbs.
Sec. 8, T. 109, R. 58	815	2	90	
Esmond	870	2	75	
Sec. 29, T. 109, R. 58	840	.....	90	Yield estimated
Sec. 29, T. 109, R. 58	845	2	100	
Sec. 35, T. 109, R. 58	906	2	50	Pressure 20 lbs.
T. 109, R. 58	600–640	2	35	Yield estimated
T. 109, R. 58	400–500	.....	20	Yield estimated
Arlington	786	.....	.....	No flow
Sec. 2, T. 110, R. 57	820	2	80	
Sec. 18, T. 110, R. 57	970	2	20	Pressure 8 lbs.
Sec. 19, T. 110, R. 57	940	.....	60	Pressure 27 lbs.
Iroquois	1115	4½	1000	Pressure 67 lbs.
Sec. 28, T. 110, R. 57	1056	.....	.....	No flow
Sec. 23, T. 110, R. 57	1055	.....	5	Yield estimated
Sec. 20, T. 110, R. 57	930	.....	15	Yield estimated
Sec. 34, T. 110, R. 57	1050	.....	20	Yield estimated
Sec. 28, T. 110, R. 58	850	1¼	35	
DeSmet	1610	.....	40	Yield estimated
Sec. 32, T. 111, R. 56	500	.....	75	Yield estimated
Sec. 5, T. 111, R. 57	600	.....	75	Yield estimated
Sec. 5, T. 111, R. 57	1170	.....	100	Yield estimated
Sec. 28, T. 111, R. 57	1090	2	75	Yield estimated
Sec. 31, T. 111, R. 57	970	2	30	
Sec. 22, T. 111, R. 58	943	.....	100	Pressure 50 lbs.
Sec. 22, T. 111, R. 58	1020	2	100	Yield estimated
Sec. 24, T. 111, R. 58	1010	.....	18	
Sec. 34, T. 111, R. 58	850	2	50	Yield estimated
T. 112, R. 56	375–600	.....	35	Yield estimated
Sec. 30, T. 112, R. 57	1066	1¼	1½	
Sec. 7, T. 112, R. 57	1120	2	4	Pressure 15 lbs.
Sec. 31, T. 112, R. 57	1060	1¼	3	
Sec. 3, T. 112, R. 58	1000	2	40	Pressure 40 lbs.
Sec. 14, T. 112, R. 58	1030	2	20	Pressure 30 lbs.
Sec. 21, T. 112, R. 58	1045	.....	100	Yield estimated
Sec. 26, T. 112, R. 58	1051	1¼	8	
Sec. 30, T. 112, R. 58	947	1¼	10	
Sec. 35, T. 112, R. 58	1040	2	45	
Bancroft	1094	2	25	

Total yield, 2,729 gallons per minute.

Total number of wells, 39.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Lawrence County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Spearfish	415	4	50	
Spearfish	275	6¼	312	
Spearfish	700	5	100	
Spearfish	400	5	30	
Spearfish	300	5	60	
Spearfish	300	5	150	
Spearfish	410	6¼	150	
Spearfish	300	4	25	
Spearfish	1610	4	¼	
Sec. 4, T. 6 N., R. 2 E.	312	.....	15	

Total yield, 892 gallons per minute.
Total number of wells, 10.

Lyman County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 7, T. 104, R. 71	737	2	300	Yield estimated
T. 104, R. 71	600	2	10	Yield estimated
Sec. 14, T. 104, R. 72	563	2	10	Yield estimated
Sec. 9, T. 104, R. 79	.....	.....	15	Yield estimated
Sec. 31 or 32, T. 108, R. 78	1653	1¼	40	Pressure 20 lbs.
Capa	1689½	3	100	
Kennebec	1301	3	50	
Vivian	1610	3	20	
Draper	2005	2½	10	
Oacoma	645–1028	3–2	90–300	
	1356	.....	60	

Total yield, 915 gallons per minute.
Total number of wells, 11.

McCook County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 8, T. 104, R. 56	123	2	30	
Sec. 17, T. 104, R. 56	86	2	150	
Sec. 21, T. 104, R. 56	175	2	.1	
Sec. 30, T. 104, R. 56	172	2	25	
Sec. 6, T. 14, R. 56	95	2	40	
Bridgewater	113	2	10	Yield estimated
Bridgewater	160	2	1½	
Bridgewater	196	2	.....	No flow

Total yield, 256 gallons per minute.
Total number of wells, 8.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

McPherson County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 24, T. 125, R. 66	1160	1¼	40	
Sec. 4, T. 125, R. 67	1190	2	80	
Sec. 8, T. 125, R. 67	1185	1¼	20	
Sec. 16, T. 125, R. 67	1180	1¼	60	
Sec. 20, T. 125, R. 67	1180	1¼	60	
Sec. 26, T. 125, R. 67	1165	2	160	
Sec. 3, T. 125, R. 68	1280	1¼	40	
Sec. 11, T. 125, R. 68	1260	1¼	30	
Sec. 25, T. 125, R. 68	1260	2	100	
Sec. 24, T. 125, R. 69	1507	.....	8	
Sec. 9, T. 126, R. 66	1150	1¼	50	
Sec. 12, T. 126, R. 66	1150	1¼	40	
Sec. 19, T. 126, R. 66	1180	1¼	60	
Sec. 30, T. 126, R. 66	1160	1¼	60	
Sec. 31, T. 126, R. 66	1170	1¼	60	
Sec. 21, T. 126, R. 67	1290	2	30	
Sec. 29, T. 126, R. 67	1230	1¼	35	
Sec. 10, T. 126, R. 68	1102	2	25	Yield estimated
Sec. 23, T. 126, R. 68	1280	1¼	50	
Sec. 11, T. 127, R. 66	1150	1¼	80	
Sec. 1, T. 127, R. 67	1220	1¼	60	
Sec. 3, T. 127, R. 67	1330	1¼	80	
Sec. 7, T. 127, R. 67	1320	1¼	30	
Sec. 24, T. 127, R. 68	1485	1¼	11	
Sec. 8, T. 128, R. 66	1280	1¼	40	
Sec. 19, T. 128, R. 66	1250	1¼	25	
Sec. 25, T. 128, R. 66	1170	1¼	26	
Sec. 28, T. 128, R. 66	1250	1¼	25	
Sec. 30, T. 128, R. 66	1250	1¼	25	
Sec. 2, T. 128, R. 67	1460	1¼	25	
Sec. 13, T. 128, R. 67	1725	1¼	25	
Sec. 14, T. 128, R. 67	1350	1¼	35	
Sec. 15, T. 128, R. 67	1425	1¼	26	
Sec. 25, T. 128, R. 67	1300	1¼	35	
Sec. 33, T. 128, R. 67	1436	1¼	30	

Total yield, 1,586 gallons per minute.
Total number of wells, 35.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Marshall County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Langford	1050	6	400–500	Pressure 60 lbs.
Sec. 6, T. 125, R. 58	960	1¼	50	
Sec. 31, T. 125, R. 58	990	1¼	35	Pressure 115 lbs.
Sec. 35, T. 125, R. 59	930	1¼	25	Pressure 55 lbs.
Sec. 35, T. 125, R. 59	925	1¼	10	Pressure 60 lbs.
Sec. 34, 2, 125, R. 60	953	2	70	
Sec. 7, T. 126, R. 56	980	1¼	60	Pressure 105 lbs.
Sec. 2, T. 126, R. 57	1110	2	15	
Sec. 5, T. 126, R. 57	1015	1¼	30	
Sec. 5, T. 126, R. 57	1015	1¼	25	
Sec. 6, T. 126, R. 57	890	1¼	35	
Sec. 7, T. 126, R. 57	960	1¼	10	
Sec. 9, T. 126, R. 57	1200	1¼	25	
Sec. 12, T. 126, R. 57	968	1¼	25	
Sec. 22, T. 126, R. 57	1018	1¼	30	
Sec. 34, T. 126, R. 57	1034	1¼	25	
Sec. 1, T. 126, R. 58	938	1¼	35	
Sec. 15, T. 126, R. 58	953	1¼	45	
Sec. 19, T. 126, R. 58	950	2	95	Pressure 75 lbs.
Sec. 26, T. 126, R. 58	965	1¼	10	
Sec. 28, T. 126, R. 58	940	1¼	30	
Sec. 12, T. 127, R. 57	940	1¼	6	
Sec. 23, T. 127, R. 57	1152	2½–1¼	40	
Sec. 32, T. 127, R. 57	1010	1¼	35	
Sec. 32, T. 127, R. 58	922	1¼	35	
Britton	1004	8–3½	600	Pressure 150 lbs.
Britton (near)	1300	2–1¼	50	Yield estimated
Sec. 3, T. 128, R. 56	980	1	18	
Sec. 11, T. 128, R. 58	930	1¼	30	
Newark	940	8–6	600	Pressure 125 lbs.
Veblen	860	.....	⅓	Pressure 15 lbs.

Total yield, 2,599 pounds.
Total number of wells, 31.

Meade County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 15, T. 6, R. 5	1116	2	35	
Sec. 22, T. 6, R. 5	337	2	60	Pressure 50 lbs.
Sec. 20, T. 6, R. 5	720	2	50	Yield estimated
Sec. 8, T. 6, R. 5	632	2	75	Pressure 20 lbs.
Sec. 26, T. 6, R. 5	1310	.....	5	Yield estimated
Sec. 8, T. 6, R. 5	755	3¾	100	Pressure 20 lbs.
Sec. 2, T. 6, R. 5	1560	.....	4	
East of Whitewood	570	.....	60	Pressure 15 lbs.

Total yield, 389 gallons per minute.
Total number of wells, 8.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Miner County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 26, T. 105, R. 58	162	2	150	
Sec. 22, T. 105, R. 58	186	2	16	
Sec. 22, T. 105, R. 58	144	2	75	
Sec. 9, T. 105, R. 58	161	2	100	
Sec. 21, T. 105, R. 58	170	2	100	
Sec. 3, T. 105, R. 58	108	2	50	Yield estimated
Sec. 7, T. 106, R. 56	126	2	90	
Sec. 24, T. 105, R. 57	150	2	70	
Sec. 30, T. 105, R. 56	228	2	100	
Sec. 20, T. 105, R. 56	100	2	75	
Sec. 19, T. 105, R. 56	113	2	40	
Sec. 20, T. 105, R. 56	146	2	40	Yield estimated
Sec. 30, T. 105, R. 56	97	.....	100	
Sec. 29, T. 105, R. 56	80	2	150	
Sec. 34, T. 105, R. 57	242	2	1	
Sec. 30, T. 105, R. 56	120	2	50	
Sec. 27, T. 105, R. 57	220	2	1	
Sec. 24, T. 105, R. 57	154	2	100	
Sec. 27, T. 105, R. 57	105	1	6	
Sec. 18, T. 105, R. 56	110	1¼	2	
Sec. 30, T. 105, R. 56	149	2	5	
Sec. 32, T. 105, R. 56	73	2	10	
Sec. 18, T. 105, R. 56	109	2	50	Yield estimated
Sec. 25, T. 105, R. 67	150	2	100	
Sec. 35, T. 105, R. 57	184	2	18	
Sec. 1, T. 105, R. 57	150	2	60	Yield estimated
Sec. 31, T. 106, R. 56	80	2	10	Yield estimated
Sec. 3, T. 105, R. 57	55	2	2	
Sec. 5, T. 105, R. 56	90	2	25	
Sec. 5, T. 105, R. 57	74	2	3	
Sec. 12, T. 105, R. 57	160	2	10	
Sec. 5, T. 105, R. 57	78	2	45	
Sec. 26, T. 105, R. 58	162	2	200	
Sec. 15, T. 105, R. 58	170	2	4	
Sec. 19, T. 105, R. 57	284	2	2	
Sec. 20, T. 106, R. 57	77	2	2	
Sec. 30, T. 106, R. 57	66	2	10	Yield estimated
Sec. 16, T. 106, R. 57	145	2	25	Yield estimated
Sec. 20, T. 106, R. 57	93	2	50	
Sec. 23, T. 106, R. 57	165	2	50	
Sec. 23, T. 106, R. 57	72	2	3	
Sec. 27, T. 106, R. 57	97	2	15	Yield estimated
Sec. 26, T. 106, R. 57	120	2	15	Yield estimated
Sec. 26, T. 106, R. 57	80	2	20	
Sec. 15, T. 106, R. 57	67	3	100	
Sec. 24, T. 106, R. 57	102	2	30	Yield estimated
Sec. 13, T. 106, R. 57	72	2	20	Yield estimated
Sec. 12, T. 106, R. 57	192	.....	50	Yield estimated
Sec. 31, T. 106, R. 57	90	2	8	
Sec. 35, T. 105, R. 57	175	2½	60	Yield estimated
T. 107, R. 56	450–580	.....	100	Yield estimated
Sec. 1, T. 108, R. 59	824	1	100	Yield estimated
T. 106, R. 58	84–100	.....	20	Yield estimated
T. 107, R. 58	60	.....	15	Yield estimated
T. 108, R. 57	884	.....	60	
T. 108, R. 57	408–450	.....	50	Yield estimated
T. 108, R. 57	405–430	.....	50	Yield estimated

Total number of wells, 57. Total yield, 2,713 gallons per minute.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Pennington County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Wasta	2287	4	40	

Potter County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 3. T. 117, R. 77	1770	2	12	
Sec. 21, T. 117, R. 77	1604	2	60	
Sec. 6, T. 117, R. 78	1761	2	50	Yield estimated
Gettysburg	2130	3	120	Yield estimated

Total yield, 242 gallons per minute.
Total number of wells, 4.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Sanborn County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
T. 108, R. 62	792	1¼	23	
Sec. 7, T. 108, R. 61	.....	2	10	Yield estimated
Sec. 26, T. 108, R. 61	.....	2	10	Yield estimated
Sec. 10, T. 108, R. 61	.....	.....	5	Yield estimated
Sec. 19, T. 108, R. 60	.....	.....	5	Yield estimated
Sec. 33, T. 108, R. 60	.....	.....	5	Yield estimated
Sec. 35, T. 108, R. 60	.....	.....	10	Yield estimated
Sec. 36, T. 108, R. 60	.....	.....	10	Yield estimated
Sec. 12, T. 108, R. 59	.....	.....	20	Yield estimated
Sec. 17, T. 108, R. 59	.....	.....	15	Yield estimated
Sec. ,7 T. 107, R. 59	.....	.....	25	Yield estimated
Sec. 9, T. 107, R. 59	.....	.....	20	Yield estimated
Sec. 21, T. 107, R. 59	.....	.....	10	Yield estimated
Sec. 23, T. 107, R. 59	.....	.....	10	Yield estimated
Sec. 25, T. 107, R. 59	.....	.....	15	Yield estimated
Sec. 27, T. 107, R. 59	.....	.....	20	Yield estimated
Sec. 28, T. 107, R. 59	.....	.....	25	Yield estimated
Sec. 28, T. 107, R. 59	.....	.....	25	Yield estimated
Sec. 31, T. 107, R. 59	.....	.....	16	Yield estimated
Sec. 32, T. 107, R. 59	.....	.....	15	Yield estimated
Sec. 32, T. 107, R. 59	.....	.....	15	Yield estimated
Sec. 33, T. 107, R. 59	.....	.....	10	Yield estimated
Sec. 1, T. 107, R. 60	.....	.....	10	Yield estimated
Sec. 9, T. 107, R. 60	.....	.....	10	Yield estimated
Sec. 12, T. 107, R. 60	.....	.....	25	Yield estimated
Sec. 13, T. 107, R. 60	.....	.....	30	Yield estimated
Sec. 14, T. 107, R. 60	.....	.....	20	Yield estimated
Sec. 16, T. 107, R. 60	.....	.....	15	Yield estimated
Sec. 22, T. 107, R. 60	.....	.....	15	Yield estimated
Sec. 23, T. 107, R. 60	.....	.....	15	Yield estimated
Sec. 24, T. 107, R. 60	.....	.....	10	Yield estimated
Sec. 25, T. 107, R. 60	.....	.....	10	Yield estimated
Sec. 35, T. 107, R. 60	.....	.....	10	Yield estimated
Sec. 9, T. 107, R. 62	689–756	1¼–2	100	Yield estimated
Sec. 30, T. 106, R. 61	560–576	2	110	Yield estimated
Sec. 12, T. 106, R. 60	580	.....	100	Yield estimated
Sec. 20, T. 106, R. 60	686	.....	110	Yield estimated
Sec. 1, T. 106, R. 59	.....	.....	75	Yield estimated
Sec. 2, T. 106, R. 59	.....	.....	75	Yield estimated
Sec. 10, T. 106, R. 59	.....	.....	80	Yield estimated
Sec. 11, T. 106, R. 59	.....	.....	100	Yield estimated
Sec. 14, T. 106, R. 59	.....	.....	100	Yield estimated
Sec. 17, T. 106, R. 59	.....	.....	90	Yield estimated
Sec. 18, T. 106, R. 59	701	.....	100	Yield estimated
Sec. 18, T. 106, R. 59	.....	.....	80	Yield estimated
Sec. 19, T. 106, R. 59	.....	.....	75	Yield estimated
Sec. 21, T. 106, R. 59	.....	.....	60	Yield estimated
Sec. 12, T. 105, R. 59	.....	.....	30	Yield estimated
Sec. 27, T. 105, R. 59	.....	.....	50	Yield estimated
Sec. 27, T. 105, R. 59	.....	.....	50	Yield estimated
Sec. 31, T. 105, R. 59	.....	.....	50	Yield estimated
Sec. 33, T. 105, R. 59	.....	.....	40	Yield estimated
Sec. 34, T. 105, R. 59	.....	.....	40	Yield estimated
Sec. 9, T. 105, R. 60	.....	2	165	Yield estimated
Sec. 12, T. 105, R. 60	.....	2	150	Yield estimated
Sec. 14, T. 105, R. 60	.....	2	50	Yield estimated
Sec. 22, T. 105, R. 60	.....	2	30	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Sanborn County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 29, T. 105, R. 60	.....	2	15	Yield estimated
Woonsocket	725	6	1150	
Woonsocket	775	.....	1000	Yield estimated
Sec. 28, T. 105, R. 60	.....	2	80	Yield estimated
Sec. 28, T. 105, R. 60	.....	2	90	Yield estimated
Sec. 27, T. 105, R. 60	.....	2	100	Yield estimated
Sec. 27, T. 105, R. 60	.....	2	110	Yield estimated
Sec. 31, T. 105, R. 60	.....	2	100	Yield estimated
Sec. 31, T. 105, R. 60	.....	2	115	Yield estimated
Sec. 32, T. 105, R. 60	.....	2	135	Yield estimated
Sec. 33, T. 105, R. 60	.....	2	140	Yield estimated
Sec. 34, T. 105, R. 60	.....	2	50	Yield estimated
Sec. 2, T. 105, R. 61	.....	1¼	60	Yield estimated
Sec. 3, T. 105, R. 61	.....	1¼	5	Yield estimated
Sec. 3, T. 105, R. 61	.....	1¼	15	Yield estimated
Sec. 14, T. 105, R. 61	.....	1¼	30	Yield estimated
Sec. 15, T. 105, R. 61, Letcher	585	3–2	80	Pressure 90 lbs.
Sec. 16, T. 105, R. 61	.....	2	125	Yield estimated
Sec. 17, T. 105, R. 61	.....	2	115	Yield estimated
Sec. 20, T. 105, R. 61	.....	2	100	Yield estimated
Sec. 23, T. 105, R. 61	.....	2	105	Yield estimated
Sec. 24, T. 105, R. 61	.....	2	110	Yield estimated
Sec. 24, T. 105, R. 61	.....	2	60	Yield estimated
Sec. 27, T. 105, R. 61	.....	2	75	Yield estimated
Sec. 28, T. 105, R. 61	.....	2	50	Yield estimated
Sec. 29, T. 105, R. 61	.....	2	50	Yield estimated
Sec. 29, T. 105, R. 61	.....	2	50	Yield estimated
Sec. 31, T. 105, R. 61	.....	2	60	Yield estimated
Sec. 7, T. 105, R. 62	.....	1¼	3	Yield estimated
Sec. 7, T. 105, R. 62	.....	1¼	5	Yield estimated
Sec. 19, T. 105, R. 62	.....	1¼	5	Yield estimated
Sec. 21, T. 105, R. 62	.....	2	10	Yield estimated
Sec. 26, T. 105, R. 62	.....	2	12	Yield estimated
Sec. 27, T. 105, R. 62	.....	2	8	Yield estimated
Sec. 30, T. 105, R. 62	.....	2	15	Yield estimated
Sec. 30, T. 105, R. 62	.....	1¼	4	Yield estimated
Sec. 34, T. 105, R. 62	.....	1¼	6	Yield estimated
Sec. 34, T. 105, R. 62	.....	1¼	8	Yield estimated
Sec. 35, T. 105, R. 62	.....	1¼	4	Yield estimated

Total yield, 6,664 gallons per minute.
Total number of wells, 96.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 23, T. 117, R. 64	.....	1¼	60	Yield estimated
Sec. 13, T. 117, R. 64	.....	1¼	20	Yield estimated
Sec. 5, T. 119, R. 60	.....	2	200	Yield estimated
Sec. 16, T. 116, R. 65	.....	1¼	150	Yield estimated
Sec. 30, T. 120, R. 61	.....	1¼	45	Yield estimated
Sec. 18, T. 119, R. 64	.....	1¼	300	Yield estimated
Sec. 14, T. 116, R. 64	.....	1¼	45	Yield estimated
Sec. 8, T. 117, R. 62	.....	1¼	35	Yield estimated
Sec. 20, T. 117, R. 62	.....	2	125	Yield estimated
Sec. 26, T. 117, R. 65	.....	1¼	65	Yield estimated
Sec. 21, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 2, T. 116, R. 65	.....	1¼	150	Yield estimated
Sec. 30, T. 117, R. 63	.....	1¼	20	Yield estimated
Sec. 11, T. 115, R. 65	.....	1¼	60	Yield estimated
Sec. 30, T. 120, R. 64	.....	1¼	75	Yield estimated
Sec. 28, T. 116, R. 63	.....	1¼	25	Yield estimated
Sec. 29, T. 116, R. 62	.....	1¼	35	Yield estimated
Sec. 33, T. 117, R. 64	.....	1¼	20	Yield estimated
Sec. 17, T. 117, R. 62	.....	1¼	35	Yield estimated
Sec. 23, T. 116, R. 62	.....	1¼	50	Yield estimated
Sec. 17, T. 117, R. 63	.....	1¼	30	Yield estimated
Sec. 7, T. 119, R. 65	.....	1¼	60	Yield estimated
Sec. 4, T. 115, R. 61	.....	1¼	25	Yield estimated
Sec. 7, T. 116, R. 60	.....	1¼	60	Yield estimated
Sec. 30, T. 120, R. 61	.....	1¼	45	Yield estimated
Sec. 35, T. 117, R. 65	.....	1¼	65	Yield estimated
T. 119, R. 64	.....	1¼	300	Yield estimated
Sec. 15, T. 116, R. 64	.....	2	175	Yield estimated
Sec. 2, T. 116, R. 63	.....	1¼	25	Yield estimated
Hitchcock	.....	2	600	Yield estimated
Sec. 13, T. 115, R. 61	.....	1¼	25	Yield estimated
Sec. 6, T. 115, R. 61	.....	1	20	Yield estimated
Conde	.....	2	90	Yield estimated
Sec. 7, T. 116, R. 61	.....	1¼	40	Yield estimated
Sec. 24, T. 117, R. 62	.....	1¼	35	Yield estimated
Sec. 9, T. 117, R. 65	.....	1¼	50	Yield estimated
Sec. 33, T. 116, R. 62	.....	1¼	35	Yield estimated
Sec. 22, T. 116, R .61	.....	1¼	30	Yield estimated
Sec. 28, T. 115, R. 65	.....	1¼	50	Yield estimated
Sec. 13, T. 115, R. 65	.....	1¼	50	Yield estimated
Sec. 23, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 9, T. 115, R. 63	.....	1¼	40	Yield estimated
Sec. 33, T. 115, R. 62	.....	1¼	40	Yield estimated
Ashton	.....	1¼	30	Yield estimated
Sec. 2, T. 115, R. 65	.....	1¼	40	Yield estimated
Sec. 24, T. 115, R. 65	.....	1¼	40	Yield estimated
Sec. 14, T. 120, R. 61	.....	1¼	45	Yield estimated
Ashton	.....	1¼	30	Yield estimated
Sec. 25, T. 117, R. 64	.....	1¼	20	Yield estimated
Conde	.....	2	80	Yield estimated
Sec. 29, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 3, T. 119, R. 61	.....	2	50	Yield estimated
Sec. 7, T. 116, R. 64	.....	1¼	45	Yield estimated
Sec. 8, T. 115, R. 64	.....	1¼	50	Yield estimated
Redfield	.....	1¼	100	Yield estimated
Frankfort	.....	1¼	125	Yield estimated
Sec. 23, T. 119, R. 63	.....	1¼	60	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 17, T. 120, R. 64		1¼	75	Yield estimated
Sec. 4, T. 118, R. 65		1¼	35	Yield estimated
Sec. 5, T. 118, R. 65		1¼	35	Yield estimated
Sec. 5, T. 116, R. 62		1¼	35	Yield estimated
Sec. 3, T. 118, R. 64		1¼	30	Yield estimated
Sec. 23, T. 118, R. 61		2	50	Yield estimated
Sec. 9, T. 119, R. 61		2	75	Yield estimated
Sec. 4, T. 117, R. 60		1¼	35	Yield estimated
Sec. 12, T. 118, R. 61		1¼	40	Yield estimated
Sec. 2, T. 117, R. 64		1¼	20	Yield estimated
Sec. 23, T. 114, R. 62		1¼	30	Yield estimated
Athol		1¼	30	Yield estimated
Sec. 11, T. 117, R. 65		1¼	40	Yield estimated
Sec. 7, T. 119, R. 60		1¼	90	Yield estimated
Sec. 10, T. 118, R. 60		1¼	25	Yield estimated
Sec. 3, T. 115, R. 64		1¼	40	Yield estimated
Sec. 19, T. 119, R. 60		1¼	30	Yield estimated
Sec. 8, T. 116, R. 64		1¼	45	Yield estimated
Sec. 31, T. 119, R. 64		1¼	300	Yield estimated
Sec. 32, T. 119, R. 65		1¼	30	Yield estimated
Sec. 9, T. 119, R. 64		1	200	Yield estimated
Sec. 1, T. 118, R. 65		1¼	35	Yield estimated
Sec. 31, T. 114, R. 61		1¼	15	Yield estimated
Sec. 35, T. 117, R. 60		1¼	125	Yield estimated
Sec. 29, T. 117, R. 63		1¼	20	Yield estimated
Sec. 24, T. 118, R. 63		1¼	10	Yield estimated
Sec. 20, T. 116, R. 63		1¼	25	Yield estimated
Sec. 23, T. 115, R. 65		1¼	60	Yield estimated
Conde		1¼	50	Yield estimated
Sec. 26, T. 119, R. 61		1¼	45	Yield estimated
Redfield		6	1900	Yield estimated
Sec. 23, T. 119, R. 63		1¼	60	Yield estimated
Sec. 2, T. 114, R. 63		1¼	30	Yield estimated
Sec. 32, T. 120, R. 61		1¼	45	Yield estimated
Sec. 34, T. 114, R. 62		1¼	40	Yield estimated
Sec. 10, T. 114, R. 63		1¼	30	Yield estimated
Sec. 14, T. 120, R. 61		1¼	45	Yield estimated
Sec. 1, T. 119, R. 62		1	25	Yield estimated
Sec. 9, T. 118, R. 60		1¼	25	Yield estimated
Sec. 11, T. 115, R. 64		1¼	40	Yield estimated
Sec. 6, T. 118, R. 64		1¼	30	Yield estimated
Sec. 2, T. 118, R. 65		1¼	35	Yield estimated
Sec. 34, T. 119, R. 63		1¼	60	Yield estimated
Turton		1¼	300	Yield estimated
Sec. 14, T. 119, R. 62		1¼	26	Yield estimated
Sec. 24, T. 116, R. 63		1¼	25	Yield estimated
Sec. 20, T. 115, R. 65		1¼	50	Yield estimated
Sec. 9, T. 119, R. 60		1	25	Yield estimated
Sec. 28, T. 118, R. 65		1¼	50	Yield estimated
Sec. 5, T. 117, R. 64		1¼	20	Yield estimated
Sec. 17, T. 118, R. 60		1¼	30	Yield estimated
Sec. 13, T. 114, R. 62		1¼	30	Yield estimated
Sec. 15, T. 118, R. 64		1¼	30	Yield estimated
Frankfort		1¼	125	Yield estimated
Sec. 3, T. 119, R. 65		1¼	30	Yield estimated
Sec. 24, T. 117, R. 65		1¼	125	Yield estimated
Doland (near)		1¼	125	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 12, T. 116, R. 61		1¼	40	Yield estimated
Sec. 33, T. 115, R. 60		1¼	5	Yield estimated
Sec. 2, T. 116, R. 60		1¼	50	Yield estimated
Sec. 14, T. 118, R. 60		1¼	25	Yield estimated
Sec. 11, T. 119, R. 62		2	60	Yield estimated
Sec. 34, T. 115, R. 62		1¼	40	Yield estimated
Sec. 20, T. 120, R. 65		1¼	180	Yield estimated
Redfield		1¼	100	Yield estimated
Sec. 33, T. 115, R. 60		1¼	5	Yield estimated
Sec. 30, T. 116, R. 62		1¼	35	Yield estimated
Sec. 13, T. 118, R. 60		1¼	25	Yield estimated
Frankfort		1¼	125	Yield estimated
Sec. 7, T. 119, R. 61		1¼	55	Yield estimated
Sec. 15, T. 119, R. 62		1¼	45	Yield estimated
Sec. 25, T. 119, R. 60		1¼	150	Yield estimated
Sec. 26, T. 114, R. 63		1¼	30	Yield estimated
Sec. 32, T. 116, R. 62		1¼	40	Yield estimated
Sec. 25, T. 114, R. 65		1¼	35	Yield estimated
Sec. 27, T. 116, R. 60		1¼	55	Yield estimated
Doland		2	300	Yield estimated
T. 115, R. 61		1¼	20	Yield estimated
Sec. 30, T. 117, R. 62		1¼	35	Yield estimated
Sec. 8, T. 119, R. 61		1¼	60	Yield estimated
Sec. 18, T. 117, R. 63		1¼	20	Yield estimated
Sec. 2, T. 118, R. 63		1¼	10	Yield estimated
Sec. 6, T. 114, R. 63		1¼	30	Yield estimated
Sec. 35, T. 116, R. 60		1¼	55	Yield estimated
Frankfort		3	40	Yield estimated
Sec. 6, T. 114, R. 63		2	40	Yield estimated
Sec. 35, T. 114, R. 62		1¼	50	Yield estimated
Sec. 31, T. 120, R. 60		2	125	Yield estimated
Sec. 35, T. 120, R. 60		1¼	100	Yield estimated
Redfield		1¼	300	Yield estimated
Sec. 35, T. 118, R. 63		1¼	10	Yield estimated
Sec. 4, T. 115, R. 60		1¼	10	Yield estimated
Sec. 33, T. 120, R. 62		1¼	20	Yield estimated
Sec. 13, T. 115, R. 64		2	100	Yield estimated
Sec. 3, T. 117, R. 64		1¼	20	Yield estimated
Sec. 15, T. 115, R. 63		1¼	40	Yield estimated
Sec. 1, T. 119, R. 61		1¼	45	Yield estimated
Sec. 5, T. 116, R. 64		1¼	50	Yield estimated
Sec. 34, T. 117, R. 64		1¼	20	Yield estimated
Sec. 31, T. 117, R. 65		1¼	40	Yield estimated
Sec. 6, T. 119, R. 62		1¼	30	Yield estimated
Sec. 13, T. 117, R. 61		1¼	110	Yield estimated
Sec. 10, T. 120, R. 60		1½	350	Yield estimated
Sec. 32, T. 119, R. 62		1¼	30	Yield estimated
Sec. 24, T. 117, R. 64		2	25	Yield estimated
Sec. 30, T. 115, R. 60		1¼	5	Yield estimated
Sec. 27, T. 115, R. 62		2	100	Yield estimated
Sec. 29, T. 120, R. 60		1¼	300	Yield estimated
Sec. 35, T. 119, R. 63		1¼	60	Yield estimated
Sec. 28, T. 115, R. 60		2	10	Yield estimated
Sec. 3, T. 115, R. 62		1¼	50	Yield estimated
Turton (near)		1	300	Yield estimated
Sec. 28, T. 118, R. 60		1¼	25	Yield estimated
Sec. 3, T. 120, R. 62		1¼	25	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 19, T. 118, R. 65		1¼	35	Yield estimated
Sec. 19, T. 120, R. 65		1¼	100	Yield estimated
Sec. 20, T. 116, R. 60		1¼	50	Yield estimated
Sec. 15, T. 115, R. 65		1¼	60	Yield estimated
Sec. 31, T. 119, R. 65		1½	70	Yield estimated
Sec. 15, T. 118, R. 60		1¼	25	Yield estimated
Sec. 5, T. 117, R. 61		1¼	100	Yield estimated
Sec. 26, T. 117, R. 64		1¼	20	Yield estimated
Sec. 25, T. 116, R. 60		1¼	45	Yield estimated
Sec. 20, T. 116, R. 60		1¼	50	Yield estimated
Sec. 11, T. 117, R. 60		1¼	25	Yield estimated
Sec. 10, T. 119, R. 63		1¼	60	Yield estimated
Sec. 2, T. 114, R. 60		1	10	Yield estimated
Sec. 23, T. 117, R. 65		1¼	35	Yield estimated
Sec. 9, T. 120, R. 62		1¼	25	Yield estimated
Sec. 3, T. 118, R. 62		1¼	25	Yield estimated
Sec. 7, T. 119, R. 64		1¼	125	Yield estimated
Sec. 21, T. 116, R. 65		1¼	150	Yield estimated
Doland (near)		1¼	100	Yield estimated
Sec. 21, T. 119, R. 60		1¼	125	Yield estimated
Sec. 7, T. 116, R. 60		2	50	Yield estimated
Sec. 14, T. 115, R. 64		1½	60	Yield estimated
Sec. 33, T. 115, R. 60		1½	5	Yield estimated
Sec. 30, T. 120, R. 61		1¼	45	Yield estimated
Sec. 35, T. 115, R. 61		1	15	Yield estimated
Sec. 35, T. 120, R. 60		1¼	40	Yield estimated
Sec. 35, T. 118, R. 65		1¼	35	Yield estimated
Sec. 29, T. 114, R. 62		1¼	50	Yield estimated
Sec. 19, T. 114, R. 64		1¼	30	Yield estimated
Sec. 8, T. 117, R. 65		1¼	60	Yield estimated
Sec. 8, T. 114, R. 62		1¼	30	Yield estimated
Sec. 24, T. 114, R. 63		1¼	40	Yield estimated
Sec. 34, T. 119, R. 62		1¼	26	Yield estimated
Sec. 9, T. 118, R. 63		1¼	10	Yield estimated
Sec. 24, T. 119, R. 60		1¼	70	Yield estimated
Sec. 18, T. 116, R. 62		1¼	35	Yield estimated
Sec. 34, T. 119, R. 60		1¼	100	Yield estimated
Sec. 28, T. 117, R. 61		1¼	75	Yield estimated
Sec. 18, T. 115, R. 63		1¼	40	Yield estimated
Sec. 30, T. 117, R. 63		1¼	20	Yield estimated
Sec. 35, T. 116, R. 62		1¼	35	Yield estimated
Sec. 26, T. 119, R. 63		1¼	60	Yield estimated
Sec. 21, T. 114, R. 60		1¼	10	Yield estimated
Sec. 36, T. 117, R. 62		1¼	35	Yield estimated
Sec. 24, T. 115, R. 65		2	100	Yield estimated
Poor Farm (near)		1¼	50	Yield estimated
Sec. 13, T. 120, R. 60		2½	90	Yield estimated
Sec. 9, T. 117, R. 64		1¼	20	Yield estimated
Sec. 10, T. 117, R. 64		2	20	Yield estimated
Crandon		2	40	Yield estimated
Sec. 31, T. 120, R. 60		1¼	45	Yield estimated
Redfield		3	900	Yield estimated
Sec. 8, T. 120, R. 60		1¼	45	Yield estimated
Sec. 3, T. 120, R. 60		1½	50	Yield estimated
Sec. 32, T. 114, R. 60		1¼	20	Yield estimated
Sec. 34, T. 119, R. 62		1¼	26	Yield estimated
Sec. 34, T. 120, R. 62		1¼	30	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 2, T. 118, R. 61		1¼	40	Yield estimated
Sec. 29, T. 115, R. 63		1¼	40	Yield estimated
Sec. 36, T. 116, R. 65		2	150	Yield estimated
Sec. 25, T. 120, R. 63		1¼	125	Yield estimated
Sec. 26, T. 117, R. 60		1¼	35	Yield estimated
Crandon		1¼	100	Yield estimated
Sec. 20, T. 117, R. 62		1¼	35	Yield estimated
Sec. 1, T. 120, R. 62		1¼	25	Yield estimated
Sec. 11, T. 120, R. 62		1¼	25	Yield estimated
Sec. 35, T. 117, R. 65		1¼	60	Yield estimated
Sec. 21, T. 117, R. 62		2	75	Yield estimated
Conde (near)		2	60	Yield estimated
Sec. 30, T. 117, R. 63		1¼	20	Yield estimated
Sec. 12, T. 118, R. 63		1¼	10	Yield estimated
Sec. 17, T. 118, R. 62		1¼	25	Yield estimated
Sec. 31, T. 114, R. 60		1¼	20	Yield estimated
Sec. 21, T. 114, R. 61		1¼	20	Yield estimated
Sec. 22, T. 120, R. 61		1¼	45	Yield estimated
Sec. 17, T. 115, R. 64		1¼	40	Yield estimated
Sec. 2, T. 118, R. 61		1¼	25	Yield estimated
Sec. 4, T. 118, R. 65		1¼	35	Yield estimated
Sec. 10, T. 115, R. 62		1¼	40	Yield estimated
Sec. 27, T. 116, R. 62		1¼	35	Yield estimated
Sec. 26, T. 115, R. 63		1¼	40	Yield estimated
Sec. 8, T. 118, R. 60		1¼	25	Yield estimated
Sec. 8, T. 118, R. 60		2	35	Yield estimated
Sec. 13, T. 119, R. 60		1¼	90	Yield estimated
Sec. 20, T. 116, R. 63		1¼	25	Yield estimated
Sec. 33, T. 114, R. 60		1¼	20	Yield estimated
Sec. 8, T. 117, R. 64		1¼	25	Yield estimated
Sec. 9, T. 116, R. 61		1¼	40	Yield estimated
Sec. 26, T. 116, R. 65		1¼	150	Yield estimated
Sec. 33, T. 118, R. 61		1¼	30	Yield estimated
Sec. 33, T. 118, R. 61		1¼	25	Yield estimated
Sec. 32, T. 118, R. 61		1¼	40	Yield estimated
Sec. 32, T. 118, R. 61		1¼	21	Yield estimated
Doland		2	275	Yield estimated
Sec. 35, T. 120, R. 61		1¼	45	Yield estimated
Sec. 20, T. 119, R. 60		1¼	30	Yield estimated
Sec. 22, T. 119, R. 61		2	100	Yield estimated
Redfield (near)		1¼	300	Yield estimated
Sec. 18, T. 119, R. 65		1¼	55	Yield estimated
Sec. 14, T. 114, R. 65		1¼	35	Yield estimated
Sec. 5, T. 115, R. 62		1¼	42	Yield estimated
Sec. 26, T. 115, R. 63		1¼	40	Yield estimated
Conde		2	100	Yield estimated
Sec. 23, T. 119, R. 60		1¼	100	Yield estimated
Sec. 28, T. 118, R. 61		1¼	40	Yield estimated
Sec. 27, T. 118, R. 65		1¼	35	Yield estimated
Sec. 27, T. 118, R. 65		1¼	40	Yield estimated
Sec. 18, T. 117, R. 64		1¼	20	Yield estimated
Sec. 3, T. 115, R. 63		1¼	50	Yield estimated
Sec. 27, T. 120, R. 62		1	20	Yield estimated
Sec. 10, T. 114, R. 64		1¼	35	Yield estimated
Sec. 28, T. 116, R. 65		1¼	150	Yield estimated
Sec. 14, T. 118, R. 61		1¼	40	Yield estimated
Sec. 18, T. 114, R. 64		1¼	30	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 4, T. 115, R. 63	.....	1¼	40	Yield estimated
Sec. 24, T. 116, R. 63	.....	1¼	25	Yield estimated
Doland	.....	1¼	110	Yield estimated
Doland	.....	1¼	125	Yield estimated
Sec. 24, T. 120, R. 60	.....	1¼	45	Yield estimated
Sec. 8, T. 116, R. 65	.....	1¼	45	Yield estimated
Sec. 2, T. 119, R. 65	.....	1¼	30	Yield estimated
Sec. 34, T. 120, R. 62	.....	1¼	25	Yield estimated
Sec. 7, T. 118, R. 64	.....	1¼	30	Yield estimated
Sec. 34, T. 116, R. 60	.....	1¼	50	Yield estimated
Sec. 10, T. 118, R. 62	.....	1¼	25	Yield estimated
Sec. 23, T. 118, R. 60	.....	1¼	25	Yield estimated
Sec. 28, T. 120, R. 63	.....	1¼	100	Yield estimated
Sec. 6, T. 115, R. 64	.....	1½	60	Yield estimated
Sec. 1, T. 120, R. 60	.....	1¼	15	Yield estimated
Sec. 1, T. 119, R. 62	.....	1¼	30	Yield estimated
Sec. 5, T. 114, R. 64	.....	1¼	30	Yield estimated
Sec. 17, T. 114, R. 63	.....	1¼	30	Yield estimated
Sec. 5, T. 118, R. 60	.....	1¼	25	Yield estimated
Sec. 22, T. 117, R. 60	.....	1¼	20	Yield estimated
Sec. 27, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 10, T. 120, R. 60	.....	1¼	25	Yield estimated
Sec. 10, T. 116, R. 62	.....	1¼	35	Yield estimated
Turton	.....	2	600	Yield estimated
Sec. 4, T. 118, R. 60	.....	1¼	25	Yield estimated
Sec. 26, T. 118, R. 64	.....	1¼	30	Yield estimated
Sec. 9, T. 118, R. 63	.....	1¼	10	Yield estimated
Sec. 25, T. 119, R. 61	.....	1¼	50	Yield estimated
Sec. 21, T. 117, R. 61	.....	1¼	100	Yield estimated
Sec. 14, T. 114, R. 65	.....	1¼	35	Yield estimated
Ashton (near)	.....	1¼	30	Yield estimated
Sec. 22, T. 118, R. 60	.....	1¼	25	Yield estimated
Sec. 35, T. 116, R. 62	.....	1¼	35	Yield estimated
Sec. 34, T. 116, R. 61	.....	1¼	40	Yield estimated
Sec. 30, T. 115, R. 60	.....	1¼	10	Yield estimated
Sec. 34, T. 120, R. 63	.....	1¼	100	Yield estimated
Sec. 19, T. 119, R. 62	.....	1¼	40	Yield estimated
Sec. 5, T. 118, R. 63	.....	1¼	10	Yield estimated
Sec. 22, T. 120, R. 63	.....	1¼	100	Yield estimated
Mellette	.....	1¼	200	Yield estimated
Sec. 18, T. 117, R. 63	.....	2	53	Yield estimated
Sec. 31, T. 117, R. 61	.....	3	300	Yield estimated
Sec. 4, T. 118, R. 61	.....	1¼	40	Yield estimated
Sec. 9, T. 119, R. 60	.....	1¼	150	Yield estimated
Sec. 5, T. 116, R. 62	.....	1¼	35	Yield estimated
Sec. 12, T. 119, R. 65	.....	1¼	40	Yield estimated
Sec. 19, T. 115, R. 64	.....	1¼	40	Yield estimated
Ashton (near)	.....	1¼	25	Yield estimated
Sec. 33, T. 119, R. 63	.....	1¼	60	Yield estimated
Sec. 15, T. 115, R. 65	.....	1¼	50	Yield estimated
Ashton (near)	.....	1¼	30	Yield estimated
Sec. 12, T. 115, R. 64	.....	1¼	40	Yield estimated
Sec. 31, T. 115, R. 64	.....	2	40	Yield estimated
Sec. 32, T. 114, R. 63	.....	1¼	30	Yield estimated
Sec. 6, T. 119, R. 64	.....	1¼	200	Yield estimated
Sec. 23, T. 115, R. 64	.....	1¼	40	Yield estimated
Sec. 34, T. 120, R. 65	.....	1¼	110	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 4, T. 117, R. 62		1¼	35	Yield estimated
Sec. 13, T. 118, R. 63		1¼	10	Yield estimated
Sec. 7, T. 118, R. 65		1¼	35	Yield estimated
Sec. 4, T. 119, R. 63		1¼	60	Yield estimated
Sec. 31, T. 115, R. 62		1¼	50	Yield estimated
Redfield		2	600	Yield estimated
Sec. 13, T. 120, R. 64		1¼	84	Yield estimated
Conde		3	300	Yield estimated
Sec. 21, T. 120, R. 64		1¼	84	Yield estimated
Sec. 11, T. 118, R. 64		1¼	30	Yield estimated
Sec. 11, T. 117, R. 63		1¼	20	Yield estimated
Sec. 1, T. 119, R. 64		1¼	100	Yield estimated
Sec. 5, T. 117, R. 63		1¼	20	Yield estimated
Sec. 29, T. 118, R. 65		2	150	Yield estimated
Sec. 10, T. 116, R. 65		2	150	Yield estimated
Sec. 23, T. 115, R. 65		1¼	50	Yield estimated
Sec. 2, T. 118, R. 64		1¼	30	Yield estimated
Sec. 7, T. 119, R. 61		1¼	40	Yield estimated
Sec. 33, T. 116, R. 62		1¼	35	Yield estimated
Sec. 7, T. 115, R. 64		1¼	40	Yield estimated
Sec. 15, T. 117, R. 62		1¼	35	Yield estimated
Sec. 7, T. 119, R. 65		1¼	45	Yield estimated
Sec. 19, T. 118, R. 62		1¼	25	Yield estimated
Sec. 26, T. 119, R. 64		1¼	300	Yield estimated
Sec. 24, T. 120, R. 64		1¼	60	Yield estimated
Sec. 19, T. 118, R. 64		1¼	30	Yield estimated
Sec. 25, T. 120, R. 61		1¼	45	Yield estimated
Sec. 18, T. 116, R. 63		1¼	25	Yield estimated
Sec. 4, T. 119, R. 64		1¼	200	Yield estimated
Sec. 27, T. 119, R. 64		1¼	150	Yield estimated
Sec. 12, T. 117, R. 62		1¼	35	Yield estimated
Sec. 19, T. 117, R. 64		1¼	20	Yield estimated
Sec. 3, T. 114, R. 64		1¼	35	Yield estimated
Sec. 25, T. 116, R. 65		2	150	Yield estimated
Sec. 18, T. 115, R. 64		1¼	40	Yield estimated
Sec. 28, T. 115, R. 62		2	200	Yield estimated
Sec. 6, T. 118, R. 61		1¼	40	Yield estimated
Sec. 4, T. 114, R. 63		1¼	30	Yield estimated
Sec. 13, T. 119, R. 65		1¼	45	Yield estimated
Sec. 15, T. 116, R. 64		1¼	45	Yield estimated
Sec. 34, T. 119, R. 64		1¼	200	Yield estimated
Sec. 26, T. 119, R. 63		1¼	60	Yield estimated
Sec. 30, T. 118, R. 62		1¼	25	Yield estimated
Sec. 34, T. 119, R. 61		1¼	31	Yield estimated
Sec. 13, T. 119, R. 62		1¼	35	Yield estimated
Sec. 21, T. 116, R. 63		1¼	25	Yield estimated
Sec. 25, T. 117, R. 63		2	53	Yield estimated
Sec. 20, T. 116, R. 62		2	120	Yield estimated
Sec. 35, T. 119, R. 65		1¼	45	Yield estimated
Sec. 27, T. 120, R. 61		1¼	45	Yield estimated
Sec. 14, T. 115, R. 65		1¼	60	Yield estimated
Sec. 34, T. 117, R. 63		1¼	20	Yield estimated
Sec. 25, T. 120, R. 65		1¼	150	Yield estimated
Sec. 18, T. 118, R. 62		1	20	Yield estimated
Sec. 18, T. 120, R. 62		1¼	25	Yield estimated
Sec. 8, T. 118, R. 64		1¼	30	Yield estimated
Sec. 26, T. 115, R. 64		1¼	40	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 30, T. 120, R. 62	.....	1¼	25	Yield estimated
Sec. 1, T. 119, R. 64	.....	2	200	Yield estimated
Sec. 21, T. 119, R. 62	.....	1¼	26	Yield estimated
Sec. 5, T. 119, R. 64	.....	1¼	150	Yield estimated
Conde	.....	1½	50	Yield estimated
Mellette	.....	1¼	130	Yield estimated
Brentford	.....	1¼	25	Yield estimated
Northville	.....	2	200	Yield estimated
Sec. 6, T. 119, R. 64	.....	2	225	Yield estimated
Sec. 7, T. 115, R. 63	.....	2	60	Yield estimated
Sec. 11, T. 119, R. 61	.....	1¼	10	Yield estimated
Sec. 18, T. 118, R. 62	.....	1¼	60	Yield estimated
Sec. 33, T. 120, R. 65	.....	1¼	100	Yield estimated
Sec. 30, T. 120, R. 65	.....	1¼	90	Yield estimated
Sec. 25, T. 119, R. 65	.....	1¼	45	Yield estimated
Sec. 13, T. 114, R. 65	.....	1¼	35	Yield estimated
Sec. 34, T. 119, R. 65	.....	1¼	45	Yield estimated
Sec. 6, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 3, T. 114, R. 62	.....	1¼	30	Yield estimated
Redfield	.....	4½	300	Yield estimated
Sec. 30, T. 118, R. 62	.....	1¼	25	Yield estimated
Sec. 22, T. 119, R. 65	.....	1¼	45	Yield estimated
Sec. 35, T. 116, R. 63	.....	1¼	25	Yield estimated
Sec. 29, T. 119, R. 65	.....	1¼	45	Yield estimated
Sec. 18, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 23, T. 116, R. 63	.....	1¼	25	Yield estimated
Sec. 6, T. 116, R. 64	.....	1¼	45	Yield estimated
Sec. 4, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 23, T. 116, R. 63	.....	1¼	25	Yield estimated
Tulare	.....	1¼	40	Yield estimated
Sec. 30, T. 120, R. 65	.....	1¼	100	Yield estimated
Sec. 10, T. 119, R. 65	.....	1¼	50	Yield estimated
Sec. 31, T. 115, R. 65	.....	1¼	40	Yield estimated
Sec. 23, T. 120, R. 65	.....	1¼	110	Yield estimated
Sec. 32, T. 118, R. 62	.....	1¼	25	Yield estimated
Sec. 17, T. 120, R. 64	.....	1¼	84	Yield estimated
Sec. 29, T. 118, R. 62	.....	1¼	25	Yield estimated
Sec. 24, T. 118, R. 62	.....	1¼	25	Yield estimated
Sec. 25, T. 118, R. 64	.....	1¼	30	Yield estimated
Sec. 22, T. 118, R. 63	.....	1¼	10	Yield estimated
Sec. 31, T. 114, R. 63	.....	1¼	30	Yield estimated
Sec. 35, T. 118, R. 61	.....	1¼	21	Yield estimated
Sec. 6, T. 116, R. 65	.....	1¼	150	Yield estimated
Sec. 13, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 5, T. 117, R. 65	.....	1¼	50	Yield estimated
Sec. 3, T. 116, R. 64 (Northern Hospital for Insane)	956	6	300	Pressure 124 lbs.
Sec. 10, T. 119, R. 60	.....	1¼	90	Yield estimated
Sec. 14, T. 120, R. 64	.....	1¼	75	Yield estimated
Sec. 30, T. 120, R. 64	.....	1¼	80	Yield estimated
Sec. 22, T. 119, R. 63	.....	2½	400	Yield estimated
Sec. 9, T. 120, R. 65	.....	1¼	100	Yield estimated
Sec. 8, T. 116, R. 62	.....	1¼	35	Yield estimated
Sec. 4, T. 116, R. 64	.....	1¼	45	Yield estimated
Sec. 2, T. 116, R. 64	.....	2	175	Yield estimated
Sec. 30, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 3, T. 116, R. 63	.....	1¼	25	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 31, T. 116, R. 64		1¼	45	Yield estimated
Sec. 24, T. 117, R. 65		1¼	50	Yield estimated
Sec. 6, T. 217, R. 64		1¼	20	Yield estimated
Sec. 27, T. 120, R. 65		1¼	90	Yield estimated
Sec. 20, T. 118, R. 62		1¼	25	Yield estimated
Sec. 26, T. 118, R. 63		1¼	10	Yield estimated
T. 116, R. 64		1¼	45	Yield estimated
Sec. 21, T. 119, R. 65		1¼	30	Yield estimated
Sec. 26, T. 119, R. 65		2½	100	Yield estimated
Sec. 28, T. 119, R. 61		1¼	60	Yield estimated
Sec. 20, T. 115, R. 64		2	50	Yield estimated
Redfield (cemetery)		2	150	Yield estimated
Sec. 19, T. 119, R. 64		1¼	175	Yield estimated
Sec. 19, T. 120, R. 64		1¼	80	Yield estimated
Sec. 9, T. 120, R. 65		1¼	90	Yield estimated
Sec. 15, T. 117, R. 65		1¼	65	Yield estimated
Sec. 27, T. 117, R. 64		1¼	20	Yield estimated
Sec. 18, T. 117, R. 62		1¼	35	Yield estimated
Sec. 30, T. 115, R. 62		1¼	40	Yield estimated
Sec. 13, T. 118, R. 61		1¼	30	Yield estimated
Sec. 17, T. 119, R. 60		1¼	60	Yield estimated
Sec. 18, T. 117, R. 65		1¼	50	Yield estimated
Sec. 23, T. 114, R. 64		1¼	35	Yield estimated
Sec. 31, T. 119, R. 62		1¼	26	Yield estimated
Sec. 33, T. 119, R. 65		1¼	45	Yield estimated
Sec. 17, T. 120, R. 65		2	200	Yield estimated
Sec. 35, T. 117, R. 64		2	100	Yield estimated
Sec. 17, T. 116, R. 63		1¼	25	Yield estimated
Sec. 34, T. 116, R. 64		1¼	45	Yield estimated
Sec. 2, T. 116, R. 63		2	80	Yield estimated
Sec. 35, T. 118, R. 65		1¼	35	Yield estimated
Sec. 4, T. 116, R. 63		1¼	25	Yield estimated
Sec. 4, T. 116, R. 63		1¼	25	Yield estimated
Sec. 31, T. 118, R. 69		1¼	25	Yield estimated
Sec. 19, T. 118, R. 64		1¼	30	Yield estimated
Sec. 32, T. 114, R. 62		1¼	30	Yield estimated
Sec. 14, T. 116, R. 62		1¼	35	Yield estimated
Sec. 12, T. 120, R. 64		2	100	Yield estimated
Sec. 3, T. 120, R. 63		1¼	125	Yield estimated
Sec. 33, T. 120, R. 63		1¼	110	Yield estimated
Sec. 5, T. 120, R. 63		1¼	100	Yield estimated
Sec. 31, T. 120, R. 63		1¼	115	Yield estimated
Mellette (near)		1¼	300	Yield estimated
Mellette (near)		1½	325	Yield estimated
Sec. 25, T. 120, R. 63		1¼	125	Yield estimated
Sec. 3, T. 117, R. 63		1¼	20	Yield estimated
Sec. 12, T. 117, R. 62		1¼	35	Yield estimated
Sec. 33, T. 119, R. 61		1¼	40	Yield estimated
Sec. 1, T. 119, R. 65		1¼	30	Yield estimated
Sec. 13, T. 119, R. 60		1¼	75	Yield estimated
Sec. 18, T. 119, R. 60		1¼	60	Yield estimated
Sec. 21, T. 120, R. 60		1¼	50	Yield estimated
Sec. 25, T. 119, R. 62		1	20	Yield estimated
Sec. 34, T. 119, R. 61		1½	55	Yield estimated
Sec. 1, T. 116, R. 62		1¼	35	Yield estimated
Sec. 25, T. 118, R. 65		1¼	35	Yield estimated
Sec. 25, T. 118, R. 65		1¼	40	Yield setimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 28, T. 119, R. 61		1¼	40	Yield estimated
Sec. 22, T. 115, R. 64		1¼	40	Yield estimated
Sec. 27, T. 119, R. 62		1¼	26	Yield estimated
Sec. 26, T. 115, R. 63		1¼	40	Yield estimated
Sec. 8, T. 119, R. 65		1¼	50	Yield estimated
Sec. 6, T. 120, R. 65		1¼	100	Yield estimated
Sec. 17, T. 120, R. 65		1¼	110	Yield estimated
Sec. 35, T. 116, R. 63		1¼	25	Yield estimated
Sec. 30, T. 119, R. 63		1¼	60	Yield estimated
Sec. 11, T. 118, R. 62		1¼	25	Yield estimated
Sec. 25, T. 115, R. 64		1¼	40	Yield estimated
Sec. 21, T. 114, R. 64		1¼	30	Yield estimated
Sec. 14, T. 116, R. 64		1¼	45	Yield estimated
Sec. 25, T. 119, R. 65		1¼	45	Yield estimated
Sec. 5, T. 117, R. 60		1¼	30	Yield estimated
Sec. 2, T. 116, R. 63		1¼	25	Yield estimated
T. 118, R. 60		1¼	25	Yield estimated
Sec. 7, T. 116, R. 64		1¼	45	Yield estimated
Sec. 31, T. 119, R. 63		1¼	60	Yield estimated
Sec. 17, T. 118, R. 65		1¼	35	Yield estimated
Sec. 8, T. 120, R. 65		1¼	110	Yield estimated
Sec. 14, T. 119, R. 65		3	180	Yield estimated
Sec. 17, T. 118, R. 63		1¼	10	Yield estimated
Sec. 25, T. 119, R. 65		1¼	45	Yield estimated
Sec. 23, T. 119, R. 65		1¼	30	Yield estimated
Sec. 32, T. 118, R. 64		1¼	30	Yield estimated
Sec. 5, T. 119, R. 65		1¼	30	Yield estimated
Sec. 6, T. 120, R. 65		1¼	110	Yield estimated
Sec. 16, T. 118, R. 61		1	15	Yield estimated
Sec. 1, T. 118, R. 61		1¼	24	Yield estimated
Sec. 23, T. 118, R. 64		1¼	30	Yield estimated
Sec. 36, T. 120, R. 61		1¼	45	Yield estimated
Sec. 7, T. 117, R. 62		1¼	35	Yield estimated
Sec. 13, T. 118, R. 62		1¼	25	Yield estimated
Sec. 27, T. 114, R. 65		1¼	30	Yield estimated
Sec. 18, T. 118, R. 62		1¼	25	Yield estimated
Ashton		3	75	Yield estimated
Athol		2	30	Yield estimated
Sec. 35, T. 116, R. 63		2	25	Yield estimated
Sec. 34, T. 119, R. 60		2	150	Yield estimated
Sec. 26, T. 119, R. 60		1¼	35	Yield estimated
Sec. 12, T. 118, R. 63		1¼	10	Yield estimated
Sec. 3, T. 114, R. 65		1½	40	Yield estimated
Sec. 10, T. 118, R. 65		1¼	35	Yield estimated
Sec. 28, T. 119, R. 65		1¼	45	Yield estimated
Sec. 23, T. 116, R. 63		2	80	Yield estimated
Sec. 27, T. 117, R. 61		1½	110	Yield estimated
		1¼	100	Yield estimated
Sec. 19, T. 114, R. 61		2	50	Yield estimated
Sec. 1, T. 117, R. 64		1¼	20	Yield estimated
Sec. 35, T. 114, R. 63		1¼	40	Yield estimated
Ashton (near)		1¼	25	Yield estimated
Sec. 10, T. 114, R. 63		2	30	Yield estimated
Sec. 19, T. 114, R. 61		1¼	20	Yield estimated
Sec. 34, T. 115, R. 63		1¼	40	Yield estimated
Ashton (near)		1¼	30	Yield estimated
Sec. 8, T. 117, R. 62		2	100	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 34, T. 118, R. 65		1¼	35	Yield estimated
Sec. 12, T. 118, R. 62		1¼	25	Yield estimated
Sec. 11, T. 114, R. 64		2	100	Yield estimated
Sec. 28, T. 115, R. 62		3	300	Yield estimated
Sec. 25, T. 118, R. 62		1¼	25	Yield estimated
Sec. 29, T. 119, R. 65		1¼	30	Yield estimated
Sec. 33, T. 119, R. 65		1¼	25	Yield estimated
Sec. 3, T. 118, R. 63		1¼	10	Yield estimated
Sec. 24, T. 119, R. 61		1¼	40	Yield estimated
Sec. 21, T. 118, R. 63		1¼	10	Yield estimated
Redfield (near)		2	125	Yield estimated
Sec. 20, T. 118, R. 62		1¼	25	Yield estimated
Sec. 4, T. 115, R. 62		2	150	Yield estimated
Sec. 3, T. 114, R. 63		2	100	Yield estimated
Sec. 31, T. 118, R. 65		1¼	35	Yield estimated
Sec. 24, T. 117, R. 64		1¼	20	Yield estimated
Sec. 34, T. 118, R. 63		1¼	10	Yield estimated
Sec. 17, T. 116, R. 63		2	80	Yield estimated
Sec. 21, T. 114, R. 63		1½	50	Yield estimated
Sec. 14, T. 177, R. 61		1¼	75	Yield estimated
Sec. 29, T. 118, R. 61		1¼	35	Yield estimated
Sec. 8, T. 117, R. 62		1¼	35	Yield estimated
Sec. 22, T. 118, R. 61		1¼	30	Yield estimated
Sec. 28, T. 117, R. 63		1¼	20	Yield estimated
Sec. 2, T. 114, R. 65		1¼	30	Yield estimated
Sec. 15, T. 118, R. 60		1¼	25	Yield estimated
Sec. 28, T. 116, R. 64		1¼	45	Yield estimated
Sec. 13, T. 118, R. 64		2	75	Yield estimated
Sec. 18, T. 118, R. 64		1¼	30	Yield estimated
Sec. 13, T. 118, R. 63		1¼	10	Yield estimated
Sec. 18, T. 118, R. 65		1¼	35	Yield estimated
Sec. 15, T. 119, R. 65		1¼	30	Yield estimated
Sec. 25, T. 118, R. 63		1¼	10	Yield estimated
Sec. 33, T. 118, R. 64		1¼	30	Yield estimated
Sec. 26, T. 117, R. 65		1¼	35	Yield estimated
Sec. 30, T. 117, R. 65		1¼	35	Yield estimated
Sec. 10, T. 118, R. 63		1¼	10	Yield estimated
Sec. 20, T. 118, R. 63		1¼	10	Yield estimated
Sec. 24, T. 116, R. 62		1¼	35	Yield estimated
Sec. 31, T. 119, R. 61		1¼	50	Yield estimated
Sec. 29, T. 118, R. 61		1¼	35	Yield estimated
Sec. 33, T. 116, R. 65		2	150	Yield estimated
Sec. 2, T. 116, R. 63		1¼	25	Yield estimated
Sec. 24, T. 119, R. 60		1¼	100	Yield estimated
Sec. 13, T. 116, R. 65		1¼	100	Yield estimated
Sec. 14, T. 117, R. 63		1¼	20	Yield estimated
Sec. 1, T. 118, R. 61		1¼	21	Yield estimated
Sec. 6, T. 116, R. 64		1¼	50	Yield estimated
Sec. 13, T. 116, R. 63		2½	90	Yield estimated
Sec. 12, T. 116, R. 64		1¼	45	Yield estimated
Sec. 33, T. 119, R. 60		1¼	30	Yield estimated
Sec. 29, T. 114, R. 65		1¼	30	Yield estimated
Sec. 9, T. 115, R. 64		2	80	Yield estimated
Sec. 16, T. 114, R. 64		1¼	30	Yield estimated
Sec. 25, T. 116, R. 62		1¼	35	Yield estimated
Sec. 9, T. 119, R. 65		1¼	30	Yield estimated
Sec. 3, T. 117, R. 64		1¼	20	Yield estimated

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 3, T. 117, R. 64	.....	1¼	20	Yield estimated
Sec. 29, T. 119, R. 64	.....	1¼	110	Yield estimated
Sec. 5, T. 118, R. 63	.....	1¼	10	Yield estimated
Sec. 20, T. 117, R. 65	.....	1¼	35	Yield estimated
Sec. 23, T. 117, R. 63	.....	1¼	20	Yield estimated
Sec. 18, T. 118, R. 60	.....	1¼	25	Yield estimated
Sec. 31, T. 119, R. 61	.....	1¼	40	Yield estimated
Sec. 31, T. 116, R. 62	.....	1¼	50	Yield estimated
Ashton (near)	.....	1¼	30	Yield estimated
Sec. 27, T. 114, R. 60	.....	1¼	20	Yield estimated
Sec. 12, T. 117, R. 65	.....	1¼	40	Yield estimated
Sec. 11, T. 117, R. 64	.....	1¼	20	Yield estimated
Doland (near)	.....	1¼	100	Yield estimated
Sec. 20, T. 119, R. 65	.....	1¼	45	Yield estimated
Sec. 11, T. 118, R. 65	.....	1¼	45	Yield estimated
Sec. 23, T. 118, R. 63	.....	1¼	10	Yield estimated
Sec. 18, T. 116, R. 62	.....	1¼	35	Yield estimated
Sec. 17, T. 118, R. 60	.....	1¼	25	Yield estimated
Sec. 11, T. 117, R. 64	.....	1½	20	Yield estimated
Sec. 8, T. 116, R. 62	.....	1¼	35	Yield estimated
Sec. 28, T. 118, R. 63	.....	1¼	10	Yield estimated
Sec. 22, T. 118, R. 61	.....	1¼	21	Yield estimated
Sec. 28, T. 118, R. 63	.....	1¼	10	Yield estimated
Sec. 31, T. 117, R. 60	.....	1¼	10	Yield estimated
Sec. 21, T. 118, R. 61	.....	1¼	30	Yield estimated
Sec. 30, T. 119, R. 60	.....	1¼	100	Yield estimated
Sec. 26, T. 118, R. 60	.....	1¼	25	Yield estimated
Sec. 7, T. 117, R. 63	.....	3	90	Yield estimated
Northville	1020	2	150	Pressure 156 lbs.
Sec. 19, T. 118, R. 63	.....	2	200	Yield estimated
Sec. 31, T. 114, R. 62	.....	1¼	50	Yield estimated
Sec. 25, T. 116, R. 63	.....	1¼	25	Yield estimated
Sec. 18, T. 118, R. 65	.....	1¼	35	Yield estimated
Redfield	.....	4½	300	Yield estimated
Sec. 25, T. 118, R. 65	.....	2	150	Yield estimated
Sec. 6, T. 118, R. 60	.....	1¼	25	Yield estimated
Sec. 32, T. 116, R. 63	.....	1¼	25	Yield estimated
Sec. 1, T. 116, R. 65	.....	1¼	150	Yield estimated
Sec. 18, T. 118, R. 63	.....	2	80	Yield estimated
Sec. 25, T. 116, R. 63	.....	1¼	25	Yield estimated
Sec. 17, T. 118, R. 65	.....	1¼	35	Yield estimated
Sec. 13, T. 117, R. 63	.....	1¼	20	Yield estimated
Sec. 24, T. 115, R. 62	.....	1¼	40	Yield estimated
Sec. 29, T. 119, R. 60	.....	1¼	100	Yield estimated
Sec. 34, T. 114, R. 62	.....	3	100	Yield estimated
Sec. 32, T. 118, R. 64	.....	1¼	30	Yield estimated
Turton	.....	2	600	Yield estimated
Sec. 8, T. 117, R. 63	.....	1¼	20	Yield estimated
Sec. 18, T. 118, R. 63	.....	1½	25	Yield estimated
Sec. 14, T. 117, R. 65	.....	1¼	40	Yield estimated
Sec. 20, T. 118, R. 64	.....	1¼	30	Yield estimated
Sec. 29, T. 115, R. 64	.....	1¼	40	Yield estimated
Sec. 8, T. 118, R. 61	.....	1¼	35	Yield estimated
Sec. 10, T. 118, R. 65	.....	2	150	Yield estimated
Sec. 10, T. 118, R. 60	.....	1¼	25	Yield estimated
Northville	980	9–6	1900	Pressure 156 lbs.
Mellette	920	6–4½	1320	Pressure 165 lbs.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Spink County—Continued

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 4, T. 119, R. 64	1065	8–6	1200	
Sec. 22, T. 119, R. 63	958	.....	60	Pressure 141 lbs.
Sec. 32, T. 119, R. 63	920	4½–3	1250	Yield estimated
Sec. 23, T. 119, R. 64	993	6–4½	1300	Pressure 135 lbs.
Sec. 19, T. 119, R. 63	930	4½	670	Pressure 153 lbs.
Redfield	964	6½–4½	1260	Pressure 177 lbs.
T. 117, R. 64	987	.....	1000	Yield estimated
.....	1025	6	1900	
Frankfort	1008	8–4½	1500	Yield estimated
Sec. 4, T. 116, R. 62	895	4½	600	
Sec. 32, T. 117, R. 62	950	4½	350	
Sec. 7, T. 115, R. 61	1050	8–4½	75	Pressure 87 lbs.
Doland	897	4½	370	Pressure 122 lbs.
Doland	957	.....	600	Pressure 112 lbs.
Ashton	925	6–4½	100	Pressure 60 lbs.
Ashton	1003	8	2000	Pressure 150 lbs.
Conde	960	4¼	75	Yield estimated
Turton	920	4½	1300	
Sec. 32, T. 114, R. 63	1150	6–4½	550	Pressure 50 lbs.
Sec. 26, T. 114, R. 63	909	.....	1200	
Sec. 18, T. 114, R. 62	1000	6–4½	150	Pressure 125 lbs.
Sec. 30, T. 114, R. 62	909	4½	1000	Pressure 150 lbs.

Total yield, 63,930 gallons per minute.
Total number of wells, 705.

Stanley County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Wendte	1395	3	90	
Nowlin	1842	3	125	Pressure 72 lbs.
Sec. 36, T. 110, R. 79	.....	2	70	
T. 5, R. 29	.....	.....	50	Yield estimated
T. 5, R. 29	.....	.....	30	Yield estimated
Paradis Ranch	.....	3	50	Yield estimated
Sec. 20, T. 5, R. 30	.....	.....	50	Yield estimated
Sec. 10, T. 4, R. 28	.....	.....	20	Yield estimated
T. 5, R. 31	.....	.....	20	Yield estimated
T. 7, R. 29	.....	.....	20	Yield estimated

Total yield, 525 gallons per minute.
Total number of wells, 10.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Sully County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Sec. 32, T. 113, R. 79	1565	3–2	200	
Sec. 11, T. 114, R. 77	1717	2	85	Pressure 21 lbs.
Sec. 3, T. 115, R. 79	1645	2	20	
Sec. 28, T. 115, R. 79	1781	2	65	Pressure 25 lbs.
Sec. 19, T. 116, R. 78	1595	2	85	Pressure 65 lbs.
Sec. 6, T. 114, R. 77	1568	1–4	75	

Total yield, 530 gallons per minute.
Total number of wells, 6.

Turner County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Hurley (near)	513	.....	250	Yield estimated
Sec. 34, T. 99, R. 55	440	.....	200	Yield estimated
T. 97, R. 53	62	2	10	Yield estimated
Sec. 18, T. 97, R. 53	60	2	15	
Secs. 13 and 18, T. 97, R. 53	85	2	5	
Sec. 33, T. 98, R. 54	50	2	8	
T. 97, R. 54	50	2	5	
Sec. 12, T. 97, R. 54	110	2	350	
Sec. 35, T. 96, R. 52	52	2	⅓	
Sec. 2, T. 97, R. 54	37	2	3	
Sec. 2, T. 97, R. 52	59	18	5	Yield estimated
Sec. 11, T. 97, R. 54	59	2½	4	
Sec. 4, T. 97, R. 54	40	2	5	Yield estimated
Swan Lake	50	2	40	

Total yield, 900 gallons per minute.
Total number of wells, 14.

Walworth County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Akaska	.....	3	50	Yield estimated
Lowry	.....	3	30	Yield estimated
LeBeau	1498	3	65	Pressure 68 lbs.
Sec. 7, T. 122, R. 77	1870	2	75	
Sec. 12, T. 122, R. 78	.....	2	20	Yield estimated
Selby	1897	2	17	Pressure 16 lbs.

Total yield, 257 gallons per minute.
Total number of wells, 6.

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ARTESIAN WELLS IN SOUTH DAKOTA—Continued

Yankton County

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Yankton—				
Excelsior Mill	493	8	3000	Pressure 52 lbs.
Fountain Roller Mills	600	6	1500	Pressure 48 lbs.
Asylum	672	4½	165	Pressure 10 lbs.
City well	942	6	880	Pressure 18 lbs.
College Hill	524	2	2600	Pressure 27 lbs.
E. P. Wilcox	455	3	330	Pressure 55 lbs.
Fred Donaldson	525	4½	300	Yield estimated
T. 93, R. 57	530–585	1¼–2	21	Pressure 30 lbs.
T. 95, R. 54	545–580	1–2	8	Pressure 6 lbs.
T. 95, R. 55	535–554	2	100	
T. 95, R. 55	266	2	90	
T. 95, R. 56	544–640	2–3	43–80	Pressure 15 lbs.
T. 96, R. 55	145–590	.....	20	Yield estimated
T. 96, R. 56	700	.....	50	Yield estimated
T. 96, R. 57	505	2	5	
Sec. 12, T. 93, R. 56	475	2	6	
Sec. 17, T. 93, R. 56	400	2	50	
Sec. 16, T. 93, R. 56	500	6–5	1300	Pressure 50 lbs.
Sec. 8, T. 93, R. 55	521	3	350	Pressure 49 lbs.
Sec. 2, T. 93, R. 55	392	1	50	
Sec. 27, T. 93, R. 55	365	2	2	
Sec. 13, T. 93, R. 54	250	2	50	
Sec. 2, T. 93, R. 54	300	2	10	
Sec. 8, T. 93, R. 54	290	2	60	
Sec. 25, T. 93, R. 54	271	2	6	
Sec. 11, T. 93, R. 54	450	2	80	
Sec. 9, T. 93, R. 54	265	2	50	
Sec. 18, T. 93, R. 54	422	3½–3	120	
Sec. 26, T. 93, R. 54	255	2	20	Pressure 10 lbs.
Sec. 18, T. 94, R. 55	480	2	55	
Sec. 22, T. 94, R. 55	522	2	30	
Sec. 19, T. 94, R. 55	648	4½–2	4	
Sec. 21, T. 94, R. 55	435	2	100	
Sec. 30, T. 94, R. 54	125	2	25	Yield estimated
Sec. 29, T. 94, R. 54	315	2	5	
Sec. 20, T. 94, R. 54	300	2	15	
Sec. 36, T. 94, R. 54	495	2	75	
Sec. 27, T. 94, R. 54	300	2	30	
Sec. 28, T. 94, R. 54	378	1¼	25	
Sec. 30, T. 94, R. 54	363	2	12	
Sec. 19, T. 94, R. 54	312	2	10	
Sec. 31, T. 94, R. 54	280	2	20	
Sec. 34, T. 94, R. 54	385	2–1¼	15	
Sec. 8, T. 95, R. 55	535	2	50	

Total yield, 11,774 gallons per minute.
Total number of wells, 44.

Indian Reservations

Location	Depth Feet	Diameter Inches	Yield per Minute Gallons	Remarks
Cheyenne Reservation	1317	8–4	500	Pressure 205 lbs.
Rosebud Reservation	2500	8–6	.....	No flow

Total number of wells, 2.

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SUMMARY—ARTESIAN WELLS IN SOUTH DAKOTA

COUNTY	Number of Wells	Flow in Gallons per Minute	Remarks
Aurora	82	5,264	
Beadle	48	17,778	List incomplete
Bon Homme	17	8,004	List incomplete
Brown	64	12,759	List incomplete
Brule	26	23,636	List incomplete
Buffalo	5	547	
Butte	65	1,731	
Charles Mix	32	10,384	List incomplete
Clay	214	2,644	
Davison	242	11,754	
Day	10	542	
Douglas	20	13,386	List incomplete
Edmunds	395	5,211	List incomplete
Fall River	3	540	
Faulk	24	2,767	List incomplete
Grant	9	205	List incomplete
Gregory	27	1,680	
Hand	73	6,146	
Hanson	49	757	List incomplete
Hughes	20	9,914	List incomplete
Hutchinson	42	1,897	List incomplete
Hyde	61	1,520	
Jerauld	11	1,558	List incomplete
Kingsbury	39	2,729	List incomplete
Lawrence	10	892	
Lyman	11	915	List incomplete
McCook	8	256	
McPherson	35	1,586	
Marshall	31	2,599	
Meade	8	389	
Miner	57	2,713	List incomplete
Pennington	1	40	
Potter	4	242	
Sanborn	96	6,664	
Spink	705	63,930	
Stanley	10	525	List incomplete
Sully	6	530	List incomplete
Turner	14	900	
Walworth	6	257	
Yankton	44	11,774	List incomplete
Indian Reservations	2	500	List incomplete

Grand total number of wells, 2,626.

Grand total yield, 238,065 gallons per minute.

The list is not complete for the reason that full returns could not be obtained from all the counties. It is apparent that the number of wells credited to Faulk, Hanson, Hughes, Hutchinson, Jerauld and several other counties will fall below the actual number of wells in operation to a considerable extent. This department has made every effort consistent with the means at its command to make the list complete and it is hoped that full information will be obtained later on.

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County and Township Wells

Under the provisions of Chapter 26 of the Revised Political Codes of South Dakota, 1903, the State Engineer is required to locate artesian wells within the state under the petitions of any county or civil township of the state. This same chapter provides that when the State Engineer is unable to make the locations requested he may deputize the county surveyor of the county in which the wells are located to make the locations requested. Under the provisions of this law the State Engineer has located or caused to be located the following artesian wells:

Date of Location	County	Location
December 4, 1907....	Faulk.....	Union Township—Lot 13 of block 11, in the town of Chelsea; said town is situated in the NE¼ of Sec. 35, T. 120 N., R. 66 W.
December 15, 1909...	Stanley.....	Lone Tree Township—At a point 310 feet north and 15 feet west of the SE corner of Sec. 5, T. 2 N., R. 25 E. B. H. M.
May 3, 1910.....	Lyman.....	Presho Township—Well No. 1, SE¼ of Sec. 6, T. 105 N., R. 77 W.; No. 2, SE¼ of Sec. 3, T. 105 N., R. 77 W.; No. 3, NW¼ of Sec. 35, T. 105 N., R. 77 W.; No. 4, SE¼ of Sec. 29, T. 105 N., R. 77 W.; No. 5, SE¼ of Sec. 17, T. 105 N., R. 77 W.
November 24, 1909...	Lyman.....	Murdo Township—At a point 9.00 chains west and 1.58 chains north of the SE corner of Sec. 8, T. 2 S., R. 28 E. B. H. M.
August 8, 1910.....	Lyman.....	Sioux Township—Well No. 1, 1,500 feet north and 180 feet west of the quarter section corner between sections 26 and 27, T. 104, R. 79; No. 2, 299 feet north and 160 feet east of the section corner to sections 11, 12, 13 and 14, T. 104, R. 79; No. 3, 2,715 feet west and 332 feet north of the section corner to sections 4, 5, 8 and 9, T. 103, R. 79; No. 4, 526 feet west and 220 feet north of quarter section corner between sections 28 and 33, T. 104, R. 79; No. 5, 960 feet west and 1,400 feet south of corner to sections 3, 4, 9 and 10, T. 104, R. 79; No. 6, 100 feet south and 100 feet west of center to Sec. 8, T. 104, R. 79.
August 11, 1910.....	Stanley.....	Willow Creek Buttes Township—Four wells.

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ARTESIAN WELL LAWS

A synopsis of the laws under which all artesian wells in this state are officially located is important at this place.

In the case of private persons, corporations or companies desiring to construct artesian wells upon ground owned or leased by themselves, the laws of this state provide that same may be lawful, but no tract of improved or occupied land within this state shall be subject to the burden of two or more waterways or ditches from said well, without the written consent of the owner of said lands.

Whenever a petition, signed by not less than fifty resident free holders of any county in this state, of whom fifteen are the owners of not less than eighty acres of land located on the watercourse on which an artesian well is to be located, is presented to the State Engineer, he is required to personally visit the locality where the wells are petitioned to be located and investigate local conditions affecting the matter. If, in his judgment, it is found practicable to locate the wells as requested, he is required to so locate the wells. After the location is made the State Engineer is required to make a report concerning his location and to file same with the county auditor of the county wherein the wells are located. This report is required to contain an estimate of cost of the proposed wells. If it is impracticable for the State Engineer to make the locations requested, he is authorized to deputize the county surveyor to make said locations.

In the case of the location of a township well, the State Engineer is required to act on petitions signed by a majority of the qualified electors of any township; the majority of electors is to be determined from the poll list of the last preceding general election of the township. The State Engineer is required to file the petition, together with his report on the location of the wells with the register of deeds of the county in which the wells are located within thirty days after the receipt of the petition. It is required that such report shall contain the number of wells located, the size of each well and the exact location of same, together with a full description thereof.

When the State Engineer has been notified of the completion of any wells located by him, the law provides that he shall inspect the same and if they are satisfactory he is required to file his acceptance of same, which must be attested to by the supervisors of the township.

If for any reason the State Engineer is unable to locate the wells as provided for in the case of townships, he is empowered to deputize the county surveyor to locate the wells, and when wells are so located by the county surveyor he is required to join with the State Engineer in the report filed with the register of deeds. When circumstances require, the State Engineer is also authorized to appoint some other competent person to make the locations of wells petitioned for.

It is also the duty of the State Engineer to measure or to cause to be measured the flow and pressure of all artesian wells, both public

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and private, that are constructed under the provisions of this chapter.

The list of flowing wells that has been given is only approximate but it furnishes some idea of the immense volume of water that is produced from the artesian basins in the state. Most of this water is practically going to waste; the larger portion of it flows directly away and is carried off into natural drainage channels. Many wells are flowing wild, in some cases the water therefrom being actually detrimental to adjacent property.

This waste of water constitutes a serious drain upon one of our valuable natural resources, and some means should be provided for conserving the artesian water supply. A paper on this subject written by Mr. F. G. Clapp, a geologist and water expert, and published in Engineering News, goes into the matter exhaustively and gives the experience of other states with artesian wells. Reference is made to this paper in the following discussion.

Various remedies for the decline of artesian wells have been proposed. Among those suggested by water-supply experts are the following:

1. Cleaning the wells.
2. Renovating the wells.
3. Facilitating the flow by artificial means.
4. Decrease in the amount of water used.
5. Prevention of waste by legislation.

The first three factors are remedies for the decline of water in any particular well or group of wells but not for the conservation of the supply. The latter must be accomplished either by limiting the number of wells or by decrease in the amount of water produced from them. The decrease in the amount of water used must be accomplished in the case of flowing wells by capping the wells or providing valves to regulate the flow, as is now done in some states. Well owners in general are prejudiced against decreasing the flow in this way, claiming that the well will be damaged in consequence of clogging with sand, as has happened in some places. It has been found, however, that where that is the case, it has generally been on account of poor construction.

In any case the greater part of the water supply can be shut off without danger of serious clogging. The danger can generally be avoided by the gradual closing of a well.

In some cases it may be found practicable to close the wells over Sundays or during periods of non-use. An example is furnished by one or two small wells in the town of Belle Fourche. When the air lift that is used to increase the flow of the railroad well at water tank near the depot, is not working these small wells flow, but their flows cease during the operation of air lift. This shows that a rest proves sufficient to accumulate a supply of water sufficient to raise the head and pressure, and several months' accumulation would undoubtedly make a difference with the supply of water immediately available.

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A full conservation of the artesian water supply is of course impossible, because of the constantly increasing need for its use. It is not proposed to interfere with the right of a well owner to a reasonable use of water if it is all going to serve a useful purpose. But for the reason that new wells are continually being drilled by parties demanding a similar supply, it is important to see that the water is not wasted. Legislation should be enacted providing that all flowing wells in the state should be capped or otherwise shut off when not in use; and when in use a stream of only the requisite size should be allowed to flow.

A number of states in the country have already realized the importance of forbidding waste of water from wells. In California a law was enacted in 1878, and it is still in effect. It provides that any artesian well which is not capped or furnished with such mechanical appliance as will readily and effectively arrest and prevent the flow of water from such a well is declared a public nuisance, and the owner, tenant or occupant of the land upon which such a well is situated who causes, permits or suffers such a public nuisance, or suffers it to remain or continue, is guilty of a misdemeanor.

The laws of Colorado respecting the use of artesian waters are much the same as those of California.

In Michigan the law provides that no person or persons, or corporation, other than municipal corporations owning or operating any artesian wells, shall allow the same to flow a larger stream than will flow through a pipe one inch in diameter, to the detriment or injury of any other well or wells, without the consent of the owners of such well or wells so injured.

The state of Washington has in force a law enacted in 1901 which provides for the regulation of flow from artesian wells under heavy penalties. In South Dakota, the laws regulating county and township wells are wisely framed and it would undoubtedly be wise to extend their application to all other flowing wells in the state, making due allowance for local conditions and municipal needs.

The recommendations for legislation embodied in the Second Biennial Report of the State Engineer are considered appropriate here. These recommendations are as follows:

First. All wild or wasteful wells should be stopped. Authority to be given the State Engineer to proceed to close or regulate such wells, using such means as may be best adapted to the case. All such wells should be closed as soon as possible.

Second. A flow of a certain number of gallons per minute, fifteen is thought advisable, should be allowed free to each quarter section, and all excess above that should be discouraged by tax. This would render excessive flow unprofitable except in special cases, like towns or factories, where temptation to waste would be small.

Third. A careful register should be kept of all wells in the state. Their location, depth, size, method of construction, flow, pressure and

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other instructive facts concerning them should be put down for reference. The cost of this to be met by a registration tax of $1.00 for each well now running and hereafter constructed, and by annual taxes for excess, as before mentioned, and possible occasional special appropriations.

Fourth. The law making it a misdemeanor to waste water, neglect valves and proper control of wells, or any interference with proper investigations of wells should be revived and strengthened.

Fifth. The State Engineer and his assistants to have strict oversight over all artesian wells of the state, with power to enforce all regulations concerning them. They should also be required to keep careful record of the pressures and the flows of at least three representative wells in every county where that number exist, and conduct such other investigations as may seem profitable to ascertain the adequacy of the artesian supply and the laws governing it, and the best method of rendering it most lasting and useful.

It was proposed that for every quarter section, fifteen gallons per minute be allowed free, but for every ten gallons per minute or fraction thereof for each quarter section, over that amount, fifty dollars should be paid into the state treasury for each year.

The Carey Act

The legislature of 1909 enacted a law providing for the acceptance of the offer of the United States in relation to arid lands, commonly known as the Carey Act. The provisions of the Carey Act have also been accepted by the following states: Colorado, Wyoming, Idaho and Montana. In all of these states much good has been accomplished through the adoption of this act. In Colorado comparatively little has been done but in the other three states hundreds of thousands of acres have been reclaimed through its instrumentality.

Under the provisions of this act, in each public land state to which it is applicable, as much as one million acres of the public lands susceptible of reclamation by irrigation may be segregated by the Secretary of the Interior and turned over to the state. The reclamation works are built by outside capital under the supervision of the state and the state turns the land over to the settler at a minimum price of 50 cents per acre, this money going into the state treasury.

This act does not conflict in any way with the United States Reclamation Act, but is supplementary thereto. In South Dakota three possible reclamation projects, in addition to the Belle Fourche project were investigated by the engineers of the United States Reclamation Service. These are the Cheyenne River project, the Rapid and Box Elder Creek project and the Little Missouri project. Of this list only the Belle Fourche project has been taken up on account of lack of funds. The Cheyenne River project was under consideration and the public lands under it were withdrawn from entry. For lack of funds, however,

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as stated above, this project was abandoned and the lands restored to entry.

The reports of the United States Reclamation Service show the following areas susceptible of reclamation under these projects:

Cheyenne River project, about 40,000 acres of first class land;

Rapid and Box Elder project, 20,000 acres;

Little Missouri project, 40,000 acres;

The Cheyenne and the Little Missouri projects are close to large areas of state land and, if developed, would enhance the value of these lands many fold.

Under the provisions of the Carey Act, as accepted by the legislature of 1909, a board known as the Carey Land Act Board was created. This board is composed of the State Engineer, the State Auditor, and the Commissioner of School and Public Lands. The State Engineer is required to serve as ex-officio chairman of said board. In accordance with these provisions the State Engineer has made diligent search and inquiry among parties in this state who are interested in the development of same, for a tract of land suitable for reclamation under this Act. On account of the enormous influx of settlers during the past two years, it appears that it is almost impossible to find any tract of land of suitable extent for reclamation as provided by the Carey Act. Numerous inquiries have been received concerning the matter of settlement and colonization of a tract of land under the Carey Act law, but up to the present time, nothing has been done in the matter.

It is thought, however, in view of recent investigations, that several small tracts of land in Butte, Harding and Perkins counties can be made available for settlement and development under the Carey Act.

DRAINAGE

Importance. The matter of drainage is one of great importance to eastern South Dakota, especially to the southeastern portion of the state. A few years ago it was little thought that drainage would ever be an important factor in our state, or that we would be troubled with too much water on our lands. But a marked change has occurred within a comparatively short time. Lake beds, and depressions that were formerly cultivated and that yielded abundant crops in former years are now under water and vast areas of flat, low lying land are now wet and unproductive.

Speaking in round figures and without having complete data available, in eastern South Dakota the area of land that is unfit for agricultural purposes because of too much water is about a half million acres. It is estimated that there are four million acres of land in the state that are wholly and partially unproductive by reason of being too wet to cultivate properly. This immense source of wealth is waiting to be utilized

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and made to do its share toward furnishing food and comfort to thousands of our citizens.

We are now confronted with an actual condition that requires a remedy. Whatever theories there may be to account for existing conditions, there can be no doubt that such conditions exist and no one will say that it is anything less than our duty to provide for meeting them in a suitable manner.

The source of all water supply is rainfall or precipitation from the clouds in the form or rain and snow. The water thus supplied to the earth is constantly returning to the sea in the form of flowing streams; or to the atmosphere by means of evaporation. Even the water that soaks in the ground is eventually brought to the surface by springs; or it is used to feed crops and trees and other vegetation; or comes to the surface by capillary attraction and is there evaporated by the action of the sun and wind.

In many cases basins or lake beds catch and hold the water which then has no natural means of escape except by evaporation.

If the means provided by nature for the removal of the water are not sufficiently rapid, the surplus water remains in the lakes and in the low-lying ground to the detriment of public health, and the successful growing of crops.

It is then that the skill of the engineer is called upon to devise the best and most economical method of disposing of the excess water. This means the application or use of drainage.

Benefits

No one will deny that drainage, intelligently designed and skillfully executed, is beneficial. In the first place it is conducive to public health to dispose of bodies of stagnant water that serve as frog ponds and as breeding places for countless swarms of mosquitoes

The improvement and maintenance of our highways require that they shall be well drained. It is impossible to maintain a good road without drainage; this is the most essential feature of good road work.

The reclamation of agricultural lands is, however, the most important feature connected with the drainage problem in our state. By reclamation is meant the placing of the area affected in the best possible condition for cultivation and crop production. This comprises not only lands that are continually under water but also those that are periodically flooded, and those that are partially submerged or water soaked.

In February, 1910, the State Engineer attended the annual convention of the State Drainage Association of Iowa, at Fort Dodge, in that state, and had an opportunity to learn at first hand something of the results of drainage over there. The president of the association made the following statement:

"In 1906 the aggregate yield of corn in Iowa was 373 million bushels; in 1908 it was 301 million bushels, a difference in favor of 1906 of 72 mil-

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lion bushels. This estimated at 50 cents per bushel, represents an immense loss, just in one crop alone. We certainly can not be mistaken when we say this loss was due entirely to water soaked land. Good drainage could have prevented a large proportion of this loss."

But we do not have to go outside our own state to observe the benefits of drainage. In Minnehaha county, ditch No. 1 was almost, but not quite, completed in the spring of 1909, when a very heavy flood occurred in the Big Sioux Valley. The ditch, because of its incomplete condition, was slow to begin operating, but it took the surplus water off rapidly and enabled the farmers in that part of the valley to raise a crop—something they had not done during the preceding four or five years. The value of that crop is more than enough to pay for the ditch. The result is that the farmers further up the valley insisted upon extending the ditch and it has been constructed as far up as Baltic, a total distance of about fourteen miles. While all localities do not have the same natural advantages for drainage, it is nevertheless true that, where drainage is needed, a well executed system will be worth many times its cost.

DRAINAGE LAWS

Under the provisions of the Drainage Code of South Dakota, which was amended by the legislature of 1909, the State Engineer was placed in charge of all drainage work to be done in the state. Under the provisions of the law he is required to co-operate with the boards of county commissioners in drainage matters. Upon receipt by the commissioners of a drainage petition, the law requires that a copy of such petition be forwarded to the State Engineer. In the case of the more important ditches the State Engineer arranges to make an examination of the proposed route in company with the county commissioners. After making the examination the State Engineer prepares a report which is submitted to the board of county commissioners. In this report the conclusions of the State Engineer concerning the feasibility of the proposed drainage are set forth; also recommendations concerning changes of route, extension of proposed ditch, nature of work required, surveys, and other matters relating to the work. No charge is made for such service, the only payments required on behalf of the commissioners being the actual expenses of the State Engineer in making the examination.

The relation of the State Engineer is purely advisory, being that of a consulting engineer. No actual field surveys can be made by him and he does not come in competition with practicing engineers in the various localities. Being a state official his view of a dranage propostion is entirely disinterested and is not affected by local interests.

It has been the aim of the State Engineer to have the drainage work of South Dakota conducted on a high plane of efficiency and to this end he has made it a point to impress the fact upon the county officials un-

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der whom the drainage work is carried on, that this purpose can not be accomplished without the hearty co-operation of such officials.

Under the provisions of the Drainage Code petitions have been filed in the State Engineer's office calling for the establishment of drainage over an area aggregating over 330,000 acres of land, involving the construction of 425 miles of main ditches, situated in twenty-seven counties in eastern South Dakota.

The following list comprises the drainage petitions which have been filed in the State Engineer's office since the enactment of the present Drainage Code:

PETITIONS FOR DRAINAGE IN SOUTH DAKOTA

Number	Name of Ditch	County	Length Miles	Area Drained Acres
1	P. L. Aker No. 3	Minnehaha	1.86	1,920
2	Henry Schroeder et al	Jerauld	4.50	2,240
3	Emil Hanson et al	Turner	3.00	2,560
4	S. N. Goodhope et al	Turner	2.00	2,560
5	John Lakings	Turner	1.50	1,920
6	E. J. Vasguard et al	Turner	0.75	1,920
7	Ditch No. 5	Davison	2.00	1,920
8	Ditch No. 3	Davison	3.00	1,920
9	Ditch No. 4	Davison	0.75	1,280
10	Ditch No. 1	Davison	0.75	720
11	Ditch No. 2	Davison	0.30	320
12	O. E. Albin et al	Union	3.00	1,360
13	Gunder Dahl	Aurora	1.50	580
14	Thos. Mulcrone et al	Hamlin	5.50	3,840
15	Clark County Ditch No. 6	Clark	2.2	15,120
16	Tom Lyons et al	Clark	3.25	1,440
17	Frank Weller	Hanson	2.00	720
18	J. H. Jones et al	McCook	1.25	1,600
19	Aug. Kueppler et al	Hanson	1.75	2,700
20	Ditches Nos. 1 and 2	Douglas	5.00	1,889
21	Aas Ditch	Sanborn	4.80	4,480
22	Alex Cameron	Sanborn	5.50	7,000
23	John Sauter et al	Sanborn	2.50	3,200
24	James Grace et al	Sanborn	5.50	6,400
25	A. Duhaime et al	Sanborn	3.50	3,200
26	Martin Anderson	Turner	1.00	1,280
27	A. H. Betts	Hanson	1.00	400
28	Oakwood Ditch	Brookings	2.6	112
29	Grant Anderson et al	Jerauld	6.50	3,500
30	Geo. Ryburn et al	Hanson	3.50	3,840
31	John Letcher et al	Hanson	2.00	1,360
32	Chas. E. Wise et al	Sanborn	7.00	8,320
33	L. S. Gage et al	Minnehaha	1.86	1,920
34	A. B. Spoor et al	Sanborn	2.25	1,280
35	Wm. Moore et al	Douglas	0.50	240
36	Peter Platt et al	Turner	1.25	1,920
37	Christ Schneider et al	Brown, Marshall, Day	14.37	7,680
38	Mrs. O. K. Fodness et al	Lincoln	3.50	2,880
39	C. M. Johnson et al	Hanson	3.75	2,240
40	Richard Tobin et al	Beadle	2.6	3,200
41	Anton Zuehlke	Minnehaha	1.00	800
42	John Gabler et al	Faulk	0.50	180
43	D. Curly et al	Lincoln	3.50	3,840
44	E. M. & C. W. et al	Sanborn	6.50	6,400

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PETITIONS FOR DRAINAGE IN SOUTH DAKOTA—Continued

Number	Name of Ditch	County	Length Miles	Area Drained Acres
45	Christian Nelson et al	Kingsbury	17.00	9,600
46	Phill Kogel et al	Jerauld	5.00	3,200
47	Jacob Larson et al	Hanson	3.75	2,560
48	Ditch No. 7	Clark	3.00	3,200
49	Charles Hanson	Miner	1.00	640
50	Ditch No. 8	Clark	3.7	1,080
51	Mo. River Nos. 1 and 2, Julia Hanson et al	Clay	28.68	32,000
52	H. R. Kibbee et al	Davison	8.50	4,489
53	Mamie I. Pyle et al	Beadle	3.1	2,560
54	Norwegian Lake	Beadle	2.0	500
55	G. A. Rist	Turner	2.0	960
56	J. A. Mitchel let al	Turner	0.50	100
57	Christ Schneider et al	Marshall, Day, Brown	14.37	7,680
58	P. J. Conklin et al	Yankton Clay	14⅝ 1⅞	30,000
59	A. Peyton et al	Hamlin	3.75	2,560
60	R. R. Stevenson et al	Lincoln	6.50	9,760
61	Emma Linde	Lincoln	2.25	2,560
62	C. W. Thompson	McCook	2.00	1,200
63	John M. Eide et al	Lincoln	4.00	2,560
64	V. H. Spracklin et al	Jerauld	3.00	1,920
65	Bovee Ditch	Union (2 mile dike)	1.00	5,120
66	Lewisohn	Union	8.24	4,320
67	Goodman Ellison et al	Clay	2.75	2,560
68	G. H. Knowlton	Lincoln	3.00	2,080
69	Ditch No. 6	Minnehaha	0.37	1,920
70	F. H. Whittaker et al., No. 1	Clay	7.00	4,480
71	F. H. Whittaker et al., No. 2	Clay	4.00	2,560
72	J. V. Brechtel, No. 3	Clay	6.25	4,000
73	F. H. Whittaker et al., No. 4	Clay	3.50	1,920
74	F. H. Whittaker et al., No. 5	Clay	4.50	2,880
75	J. V. Brechtel, No. 6	Clay	6.00	3,840
76	F. H. Whittaker et al., No. 7	Clay	4.00	2,560
77	Sturk Lee et al	Clay	4.00	2,560
78	John Lakings	Turner	*	
79	M. L. Mortensen	Yankton	†	
80	Jacob Larson et al	Hanson	4.50	1,600
81	Levee District No. 6	Clay, Turner (levee)	3.37	1,960
82	Nick Barrett	Hamlin	7.80	1,360
83	Frank T. Nelson	Day, Marshall, Brown	14.37	7,680
84	Frank T. Nelson	Day, Marshall, Brown	14.37	7,680
85	Conde Ditch	Spink	10.68	6,200
86	Hardy No. 5	Brookings, Kingsbury	7.75	2,960
87	F. C. Pier et al	Sanborn	3.67	
88	Lundy Ditch	Hamlin	1.03	160
89	Lake Marsh	Hamlin	6.00	2,400
90	H. J. Larson	Turner	0.72	320
91	Levee District No. 5	Turner	3.07	690
92	A. W. Borth	Hutchinson	2.11	640
93	Sidney E. Tilton, No. 2	Hutchinson	2.50	800
94	Sidney E. Tilton, No. 3	Hutchinson	3.00	1,120
95	City of Doland	Spink	1.00	160
96	Fulton	Hanson	1.00	320
97	A. C. Howe	Day	3.00	2,080
98	City Ditch No. 1	Sanborn	4.50	6,100
99	M. H. Peterson	Miner	1.50	165
100	Charles Thompson, No. 7	Minnehaha	0.25	160
101	Clear Lake	Clark	5.00	3,000

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PETITIONS FOR DRAINAGE IN SOUTH DAKOTA—Continued

Number	Name of Ditch	County	Length Miles	Area Drained Acres
102	Wm. Marquette	Grant	0.50	50
103	A. L. Morris	Sanborn	2.40	3,430
104	F. C. Pier	Sanborn	2.50	1,320
105	Sorenson, No. 6	Turner	4.69	2,800
106	Doland	Spink	.....	
107	Frank J. Bruns	Lincoln	3.00	3,360
108	L. C. Bedell	Clay	6.00	1,920
109	Vermillion Valley	Clay	11.07	6,600
110	B. J. Jonnes	Union	1.40	2,560
111	Mallard Lake	Clark	5.00	3,000
112	P. W. Peterson	Clay	‡	
113	Joseph Childs	Miner	1.20	135
114	Joseph Childs	Miner	2.10	200
115	C. D. Bennett	Miner	2.20	450
116	Thos. J. Libertin	Bon Homme	5.20	3,000
117	J. L. Wood	Charles Mix	2.50	680
	Totals		456.18	353,510
	Counted more than once		28.74	15,360
	Grand totals		427.44	338,150

* Enlargement of Sorenson ditch

† This project is merged into No. 58.

‡ Same as Vermillion Valley.

TILE DRAINS

In the execution of the drainage work in this state, the following tables, prepared by Prof. Derr and published in the Dakota Farmer, have been found to be of considerable service and are given herewith:

Drainage Table A

Number of acres of land from which one-fourth inch of water will be drained in twenty-four hours by outlet tile drains not exceeding 1,000 feet in length and of diameters and grades indicated.

Diameter of Tile in Inches	Grade per 100 Feet in Inches ½ in.	1 in.	1½ in.	2 in.	3 in.	6 in.	9 in.
5	17.3	19.1	20.6	22.1	25.1	32.0	37.7
6	27.3	29.9	32.5	34.8	39.6	50.5	59.4
7	39.9	44.1	47.7	51.1	58.0	74.0	87.1
8	55.7	61.4	66.5	71.2	80.9	103.3	121.4
9	74.7	82.2	87.9	95.3	108.4	138.1	162.6
10	96.9	106.7	115.6	123.9	140.6	179.2	211.1
12	152.2	167.7	181.7	194.6	221.1	281.8	331.8
14	222.8	245.3	265.8	284.9	323.5	412.9	485.8
16	310.2	341.4	369.5	396.3	449.9	573.7	675.2
18	414.4	456.4	494.4	529.1	601.8	767.4	902.3
20	537.6	591.5	640.4	686.3	780.0	994.5	1170.1

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Drainage Table B

Number of acres of land from which one-fourth inch of water will be drained in twenty-four hours by lateral tile drains of diameters and grades indicated.

Diameter of Tile in Inches	Grade per 100 Feet in Inches 1½ in.	3 in.	6 in.	9 in.	1 ft.	1½ ft.	2 ft.	3 ft.
2½	3.0	4.3	6.0	7.4	8.5	10.4	12.0	14.7
3	4.4	6.4	8.9	11.1	12.8	15.6	18.1	22.1
4	7.8	11.0	15.7	19.2	22.1	27.1	31.2	38.3
5	11.7	16.6	23.3	28.5	32.9	40.5	46.6	51.7
6	17.9	25.5	36.0	44.2	51.0	62.5	72.0	88.3
8	32.4	45.1	64.8	79.3	91.7	112.1	130.0	159.0
9	49.5	70.1	99.0	122.0	140.2	171.7	198.0	243.0
10	70.0	99.0	140.0	173.0	198.0	242.2	280.0	343.0
12	102.0	144.0	204.0	249.0	288.0	353.0	408.0	499.0
15	178.0	251.0	356.0	436.0	503.0	617.0	712.0	871.0
18	281.0	397.0	562.0	687.0	794.0	974.0	1134.0	1374.0
20	365.0	516.0	730.0	892.0	1032.0	1263.0	1460.0	1786.0
24	626.0	886.0	1252.0	1534.0	1772.0	2169.0	2504.0	3071.0

WORK OF STATE ENGINEER'S DEPARTMENT

Since the establishment of this department, early in 1906, the work which the State Engineer has been called upon to perform has increased greatly in scope and importance. The official duties of the department were originally limited to work relating to the appropriation of water for irrigation, water power and other beneficial purposes, but these duties have been materially enlarged in scope and extent from time to time.

The State Engineer is now charged with the following duties:

Administering the State Water Code;

Locating artesian wells for counties and townships;

Carrying out the provisions of the drainage laws;

Acting as member of a special commission to lay out grounds of state charitable and penal institutions.

In addition, he has assumed the work of laying out the new capitol grounds and supervising the grading and landscaping of same. This latter work is done in co-operation with the state capitol commission.

A brief synopsis of these several duties will be given, under their respective headings:

State Water Code

The duties of the State Engineer in administering the Water Code of South Dakota may be classified as follows:

1. Exercising a general supervision over the use and distribution of the non-navigable waters of the state.

2. Supervising the construction of dams and reservoirs for water storage.

3. Making hydrographic surveys and investigations of the various stream systems and sources of water supply in the state.

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4. Tabulating and recording all available data relating to the determination, development and adjudication of the water supply of the state.

This department in the beginning of its administration formulated rules and regulations necessary to carry into effect the provisions of the Water Code. These rules designate the proper method of making applications for water rights, the kind of surveys necessary to be made, the nature and form of construction suitable for dams and reservoirs, and the size and form of maps to accompany water right applications. A circular containing this information was prepared and printed for free distribution to all who are interested in such matters. Detailed information relating to dry draw locations, blank forms, etc., is furnished in another part of this report.

Locating Artesian Wells

The operations relating to the location of flowing wells for counties and townships were confined mainly to the territory west of the Missouri river. Locations were made in Lyman and Stanley counties for a number of wells under the provisions of the law relating to townships. In some cases, after the locations were made the vote was against constructing wells. In other cases the wells have been voted for and contracts made for constructing them.

Laying Out Institution Grounds

By a law enacted by the legislature of 1909, the State Engineer was made a member of a commission for platting the grounds and designating the site for new buildings on the grounds of the several charitable and penal institutions of the state of South Dakota.

In compliance with this law and at the request of Dr. J. K. Kutnewsky, the State Engineer went to Redfield on March 15, 1909, to inspect the hospital grounds with a view to having them landscaped; and in company with Dr. Kutnewsky drove over the grounds and looked over the location of the several buildings and the site of the proposed new buildings.

The "lay out" appeared to be favorable for a very attractive proposition in the way of landscape effects and high hopes were entertained of procuring an acceptable and beautiful design.

It was deemed necessary to have a stadia survey of the grounds of the hospital made for the purpose of obtaining data for making a topographical map of same. In accordance therewith Mr. F. C. Huffman, who was then Assistant State Engineer, went to Redfield on March 23, 1909, and made the survey required and a topographical map of the grounds was then prepared. Full data concerning the kinds of trees and shrubbery which are growing on the grounds and which it was possible to utilize in the improvement of the grounds were obtained; also the architect's plan of the new building which was to be constructed at the hospital, photographs of the present buildings of the institution and also a

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schedule of cost per cord of native boulders split into dimension stones for use in building retaining walls, etc., were obtained and this information was forwarded to Mr. F. R. Meier of New York, the landscape artist who made the plans for the improvement of the grounds surrounding the new capitol building. Under the direction of the State Engineer, Mr. Meier made the plans for the proposed improvement and these plans, together with a water color drawing showing the grounds as they would look when completed, were submitted to the commission. It is hoped that these plans will ultimately be carried out in their entirety.

Drainage Work

The general provisions of the present State Drainage Code and the duties of the State Engineer thereunder, have already been stated in this report. A brief synopsis of details will be given here:

Minor Ditches. Many of the ditches intended for draining small areas are of small dimensions and these may properly be classed as minor ditches. The classification of ditches, for which petitions are made, is left to the State Engineer, who carefully considers each petition received by him. In a case where a ditch of this class is called for the State Engineer places the petition on file and fills out Form 1, relating to drainage, and forwards same to the auditor of the county in which the proposed drainage lies. This form is as follows:

Form 1—Drainage. No.....

STATE OF SOUTH DAKOTA
Office of
State Engineer, Pierre

.....19.....

To the County Auditor of.....County, South Dakota:

Upon examination of the drainage petition filed by.....
and others in your office on the.....day of....., 19....., it is my judgment that the proposed ditch is a minor one which will not need my attention.

In case, however, the ditch is established this office should be furnished with the name of the ditch and with all plans and profiles, together with a copy of the surveyor's reports, and upon the completion thereof a statement by you showing its cost.

In case any material increase in the length of the ditch should be contemplated beyond that described in the petition, this office should be promptly furnished with the data in reference thereto in sufficient time to allow a due consideration thereof before its establishment.

.....
State Engineer.

By.....
Deputy.

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In case of an important ditch, the State Engineer arranges to inspect the route of the proposed drainage in company with the board of county commissioners. The necessity for the drainage asked for is determined upon and the State Engineer fills out Form 2, in accordance with such determination and forwards it to the county auditor.

Form 2—Drainage. No.....

STATE OF SOUTH DAKOTA
Office of
State Engineer, Pierre

.....19.....

To the County Auditor of.....County, South Dakota:

The undersigned having, together with the board of county commissioners of your county, inspected the route of the proposed drainage ditch under the petition filed by.....and others in your office on the.....day of....., 19....., does hereby report that he.....concurs in the opinion of the board that a survey of the proposed drainage is.....necessary.

Attention is called to the provisions of Section 1 (old number Section 3) of Chapter 102 of the Laws of 1909 concerning the furnishing of information to this office in regard to such ditch.

.....
State Engineer.

By.....
Deputy.

If the drainage project appears to be feasible, after careful inspection by the State Engineer, he fills out Form 3 and forwards it to the board of county commissioners. In many instances drainage projects can be enlarged to reclaim territory in addition to that designated in the petition. In such cases the State Engineer makes suitable recommendations in his report.

Form 3—Drainage. No.....

STATE OF SOUTH DAKOTA
Office of
State Engineer, Pierre

.....19.....

To the Board of County Commisioners of.....County, South Dakota:

Gentlemen: Pursuant to the inspection made on.....19....., by you and the undersigned, of the route of the proposed drainage ditch under petition of....., filed.....19....., I hereby report that, in my opinion, the proposed drainage appears to be entirely feasible, and I recommend that you employ a competent surveyor to make the survey thereof.

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The following additional recommendations are herewith submitted for your consideration:

.....

.....

.....

State Engineer.

By.....

Deputy.

Capitol Grounds

The capitol grounds at Pierre comprise an area of about twenty acres, most of which is broken and uneven. The construction of the new capitol building necessitated the grading and improvement of the grounds surrounding it.

It was evident that this work should be done in conformity with some general plan which should preferably be the design of a skilled landscape architect and engineer.

The capitol commission authorized the State Engineer to take up the matter and a comprehensive plan for landscaping the grounds was secured from Mr. F. R. Meier, a landscape engineer of great ability.

This plan was adopted by the capitol commission and it was decided to carry out without delay that portion of the plan comprising the grounds adjacent to the new capitol building. This work comprised the movement of nearly 100,000 cubic yards of earth and the expenditure of about $20,000. The grading was done under contract, and the specifications for same were prepared by the State Engineer and the supervision of the work was under his department. This entailed a vast amount of extra labor, in the way of establishing grades, furnishing monthly estimates of work done by contractor, making a complete measurement of the work upon completion of contract, and making out final estimate for same. No extra pay or allowance was asked for or expected for these services, it being considered that same were rendered for the general good.

In the construction of the capitol building the State Engineer acted as supervising engineer for the capitol commission. This duty was assumed with the understanding that it would in no way interfere with the regular duties of the State Engineer; and by working outside of regular office hours, on holidays, etc., this was accomplished. Some extra compensation was given for this service, but not as much as would have been paid an ordinary superintendent for his time. The satisfactory results obtained by having an expert engineer supervise construction details, revise plans for sewerage, heating and ventilation, and also make special designs for foundations of building in place of the defective original designs, are some compensation for the long hours of toil and anxiety incurred to accomplish this consummation.

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Public Buildings

The State Engineer has from time to time been called upon to examine and report upon the condition of buildings belonging to state institutions. Such requests have always been given prompt attention and in every case the engineer has personally looked after the requirements of the situation.

On May 12, 1910, the following letter was received from the governor:

Brookings, S. D., May 11, 1910.

S. H. Lea, State Engineer,
Pierre, South Dakota.

Dear Sir: I have been requested by a member of the Board of Regents, for you as the expert on building construction, to meet with the board of Brookings, on the 18th and examine a building that was condemned some years ago, although not officially done.

I trust you can comply with this request as it is quite important.

Kind personal regards,

(Signed) —R. S. Vessey.

In accordance with this request, I visited Brookings on May 18, 1910, and went at once to the South Dakota State College, where I found the Board of Regents in session. I was informed that the building to be inspected is known as Central building, and that this structure has been considered more or less unsafe for a number of years. I made a thorough examination of the building, being assisted in this work by Prof. Solberg, a member of the College faculty.

The results of this examination are embodied in a report made by the State Engineer to the Regents of Education. This report contains a recommendation to the effect that steps be taken to place the building in a safe condition.

Co-operation With Federal Government

The State Engineer has been called upon at various times to cooperate with the agencies of the federal government in their departmental work in this state. An example of such co-operation is afforded by the proposed irrigation system at the United States Indian School at Pierre. The superintendent of the school, Mr. Rastall, obtained the services of two irrigation experts to design a system by which the water flowing from the large artesian well at the school can be utilized for irrigating the school gardens and fields. At his request the State Engineer conferred with these experts and agreed with them upon a plan whereby the artesian water can be used to the best advantage for irrigation.

The results will be watched with interest since the question of practical use of artesian water in this portion of the state has been discussed from both sides for years, but it has never been put to a practical test by men familiar with irrigation practice.

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If this work proves a success it will mean a large extension of irrigated farming in South Dakota. Such assistance to crops can be made of great value even in sections where the annual rainfall is sufficient as a rule to mature crops, but where a little assistance in a temporarily dry period will largely increase the yields.

Special Good Roads Agent

At the request of the office of public roads, United States Department of Agriculture, the State Engineer consented to act as a special agent for this department in the matter of collecting data relating to the public roads of South Dakota. It was the object of the department to obtain as fully as possible information relating to the number of miles of road, the character of same, the amount of improved roads, etc., in each county in the state. This information was desired for the purpose of publishing same in the form of a bulletin for distribution to all who might be interested in good roads. In order to obtain this result, letters were sent to each of the county auditors in the state, and also to various road officials in different counties and to others who are interested in the matter of good roads for the state of South Dakota.

The information furnished by these replies were very meager, but very little work having been done over the entire state in the way of procuring what is termed improved roads. This showed conclusively that some good law relating to the construction and maintenance of the roads of South Dakota under expert engineering supervision, should be taken under advisement at an early session of the legislature.

Bulletin on South Dakota

At the request of Prof. Samuel Fortier, Chief of Irrigation Investigations, United States Department of Agriculture, the State Engineer prepared for the United States Office of Experiment Stations a bulletin, entitled, "Irrigation in South Dakota." This has been published by the United States Department of Agriculture as Bulletin No. 210. It contains information relating to the general characteristics and physical features of the state, including reference to the amounts and seasonal distribution of rainfall, the average temperatures in typical localities, population, principal industries, etc. The principal subjects discussed are: Water resources, lands, irrigated products, history of irrigation development, irrigation enterprises, laws governing the control and use of water, settlement of lands under irrigation systems, and future development of irrigation farming.

This bulletin is intended for free distribution to intending settlers and those interested in irrigation work in this state. This bulletin has been widely circulated, many hundreds of copies having been furnished to parties making request for same. There are still a number of copies available for free distribution and those who wish to obtain this bulletin should apply to the Division of Publications, United States Department of Agriculture, Washington, D. C.

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Farmers' Institute Work

On January 28, 1910, a letter from Judge A. E. Chamberlain, Superintendent of Farmers' Institutes, was received by the State Engineer, requesting his co-operation in Farmers' Institute work. It was first thought that about ten days' time with the regular institute work in the southern part of the state would be sufficient, but later it was decided that this time should be extended through the entire season of meetings. The State Engineer considered this work of sufficient importance to merit an extra effort on his part, and arrangements were made for him to attend the various institutes as requested, and to co-operate fully with Judge Chamberlain.

He began with the first meeting of the series at Garretson, on February 14, 1910, and continued through practically the entire list of places, ending at Iroquois on March 26.

The following subjects were discussed by the State Engineer: Drainage, Good Roads and Concrete Construction. Nearly thirty places were visited, more than fifty addresses were made, and over 1,000 miles were traveled by the Engineer in this work.

It is believed that the results have been of sufficient value to fully justify the undertaking.

Official Trips

In the discharge of his official duties the State Engineer is called upon at various times to visit different localities. From a study of irrigation problems in the western part of the state he may be called to one of the eastern counties to furnish advice and assistance concerning drainage matters.

The calls for the State Engineer's presence at different places in the state have been so frequent that a considerable portion of his time is spent in making these trips and the total distance traveled by him will aggregate several thousand miles in the course of a year.

From December, 1908, to October, 1910, a period of twenty-two months, the State Engineer, in addition to Farmers' Institute work, made thirty-seven trips and traveled an aggregate distance of 22,000 miles. Part of this travel comprised attendance at the Dry Farming Congress of 1909 at Cheyenne, the National Irrigation Congress of 1909 at Spokane, the National Farm Land Congress of 1909 at Chicago, and the National Irrigation Congress of 1910 at Pueblo. At each of these meetings the State Engineer was given a place on the program where an opportunity was afforded to take part in the proceedings and also to call attention to the advantages and opportunities offered by South Dakota to prospective settlers.

A large proportion of these trips comprised visits to localities where drainage was needed, for the purpose of insepcting local conditions affecting the proposed drainage. Such visits were made in company with the board of county commissioners of the respective counties, in compli-

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ance with the requirements of the Drainage Code. In this way more than twenty counties were visited and several hundred miles were traveled in automobiles and private conveyances.

Other trips were made for the purpose of visiting and inspecting irrigation works and water power propositions in the western portion of the state. This vast amount of travel entailed much labor and inconvenience on the part of the State Engineer, but in most cases, it was only by personal inspection that important questions could be properly decided.

It is thought that a brief account of some of the more important trips would be of interest and the following statement is submitted:

Trip on Seed Special

At the invitation of Mr. C. T. Dike, superintendent of the Pierre, Rapid City and Northwestern Railway, the State Engineer accompanied a party of agricultural experts on a lecture trip over that railway from Pierre westward on March 23, 24 and 25, 1909. The train was called the Seed Special, and the speakers comprised Mr. A. E. Chamberlain, superintendent of Farmers' Institutes, and Prof. Willis and Prof. Wilson of the Agricultural College at Brookings. Mr. Chamberlain talked on Dry Farming, Prof. Willis spoke of soil, climate and seeds, and Prof. Wilson spoke about live stock, cattle, etc.

Stops were made at various towns along the line from Midland to Underwood. At each place addresses were made by Messrs. Chamberlain, Wilson and Willis. At the three places furthest west, Quinn, Wall and Underwood, the State Engineer made addresses to the audiences assembled. He spoke as follows:

Ladies and Gentlemen:

Mr. Chamberlain, Prof. Willis and Prof. Wilson are here to tell you all about dry farming, seed selection, and beef and dairy cattle, and I could add nothing of value to the information they furnish on these subjects. I will, however, say a few words concerning irrigation, dry draw filings, and desert claims, for I understand there are many people pres- who are interested in such matters.

1. **Appropriations of Water**—Under the State Water Code, all the waters of the state are public waters and, except in the case of navigable streams, are subject to appropriation for beneficial use. When it is desired to appropriate water from a running stream, an application should be made to the State Engineer for a permit to appropriate the designated quantity of water. Such application is made on a printed form, copies of which can be obtained from the State Engineer's office upon request. A map showing the location of the proposed point of diversion, the lands to be irrigated if the water is wanted for irrigation, or the place where the power is to be generated if the water is to be used for power purposes, should accompany the application. The State Engineer then examines the records of his office and, if he finds there is sufficient water

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available, prepares the necessary papers and directs the applicant to advertise his intention to appropriate water in some newspaper of general circulation in the stream system, in accordance with the requirements of the law. If there is no unappropriated water available, the applicant is duly notified as soon as this fact is disclosed by the examination and the proceedings are stopped; in this case no publication is necessary.

2. **Dry Draw Filings**—In case it is desired to store and appropriate flood waters on dry draws, a different method of procedure is necessary. Under the provisions of Section 31, Chapter 180, of the Session Laws of 1907, any person, association, company, etc., owning land in South Dakota may construct a dam across a dry draw for the purpose of catching and storing storm or flood water for beneficial use. In making an appropriation of this kind, a location notice must be posted at the site of the proposed dam and a copy of the notice must be filed with the register of deeds of the county in which the notice is posted. A copy of the notice should be filed in the office of the State Engineer. This is a simple mode of procedure and it can easily be followed by any one who desires to construct a reservoir for storing storm waters. It should be borne in mind, however, that the law requires any one appropriating the waters of any dry draw or water course under this act, shall, within sixty days after posting the notice, building and construct the dam for the purpose of catching and diverting the said waters and proceed with due diligence to divert the same for beneficial purposes.

Desert Claims. All of you who are interested in desert claims are doubtless familiar with the requirements of the General Land Office concerning rights of way for ditches and canals over public lands. This matter does not come under the jurisdiction of the State Engineer but the water right which it is essential to have on a desert claim must be obtained through him. I am informed that the General Land Office requires each entryman, before making final proof to produce a certificate from the State Engineer to the effect that said entryman has obtained a water right in accordance with the state water law. Before issuing such a certificate the State Engineer requires evidence that the applicant has completed his diversion works and has applied the water beneficially to the land. Such evidence can be obtained by personal inspection but, in order to save expense, the State Engineer generally authorizes some well known and competent engineer who is located conveniently to the works, to inspect them and report thereon. Upon receipt of proof of application of the water to beneficial use, the State Engineer issues a certificate that the entryman is entitled to a water right; this certificate can be used by the entryman for filing in the United States land office.

Surveys and Maps. For ordinary dry draw filings maps are not required, although it is always desirable to have a map showing location of diversion works and lands to be irrigated, for filing with every water right or permit. For water right filings on desert entries it is necessary to file with the State Engineer copies of such maps as are required by

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the United States land office. The location notice should designate the available drainage area for each dam as it is proposed to construct.

Application Blanks. Blank forms for making applications to appropriate water and also blank location notices for use on dry draws can be obtained free of charge from the State Engineer. All applications or locations should be made on the official forms and they must conform to the requirements of the State Engineer's office. There are also a number of forms issued for use in making proof of completion of works and of the application of water to beneficial use; these forms can also be obtained free of charge upon application to the State Engineer. Full information will also be furnished by him, upon the request of any applicant, concerning the water laws of the state and the rules and regulatioins of his department relating thereto.

Construction of Dams. I wish to say a few words about the construction of dams by the settlers in this section. In most cases the dams for forming reservoirs are built of earth since this is the most convenient and available material for the purpose. All such dams should be constructed in a substantial manner in order to insure safety and durability. For small or low dams the matter is not so important, but dams ten feet high or over should be of proper design and constructed under competent supervision. They should have sufficient top width and the front and back slopes should be sufficiently flat for stability. It is far more economical to build a dam that will stand than to put up a cheaper one that will go out at the first high water.

An important feature in dam construction is a wasteway of ample size and suitable material. It should preferably be located some distance away from the dam in order that the overflow will not cause damage. It should be large enough to take care of the surplus water and should be built of material that will not wash or disintegrate.

A dam built according to the above suggestions will afford satisfaction; it will be practically safe from danger of destruction by high water during the flood season.

While irrigation is only partially developed in this state at present, the time will come when every drop of available water from running streams in the irrigable areas will be appropriated. We will then have to depend upon storm waters, properly conserved, for additional irrigation. After all this water has been made use of there will remain a vast area where farming will have to be carried on by dry farming methods. Even on dry farms, however, there will be opportunity for partial irrigation.

However successful the dry farmer may be and however productive his farm, the situation will be barren and dreary unless he provides an attractive home. A suitable location should be selected and a comfortable home made thereon. Fruit and shade trees should be planted, a garden made, and a nice lawn established; all these factors going to render the home attractive and comfortable.

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Small Reservoirs. Such attractive surroundings are obtainable by the use of water for partial or incidental irrigation. Even in humid sections of this country lawns are watered and gardens are irrigated for the purpose of promoting their growth.

In the case of a dry farm the water required for such incidental irrigation can be obtained from small storage reservoirs filled by storm or flood waters. In making such reservoirs a natural depression or draw can be utilized for holding the water by constructing a dam at some suitable place. It is a matter of surprise to see what can be done in the way of reclaiming land by even a moderate sized reservoir. In Butte county there are many such reservoirs which, to my own knowledge, are doing excellent service in furnishing irrigation water to small areas.

Gardens and Orchards. By such means a home garden can be maintained and a small orchard irrigated to furnish vegetables and fruit for home consumption. I know of an irrigated apple orchard only a few acres in size, in Fall River county, which brings in an income of from $1,500 to $2,000 a year. The water for this orchard is supplied from a stream but only a small ditch is required to carry the water which could easily be furnished by a moderate sized reservoir. The idea I wish to convey is that only a limited amount of irrigation water will be needed for an orchard where proper dry farming methods are employed and where the rainfall is conserved in the ground as it should be.

In the same manner partial irrigation can be supplied from a reservoir to eke out the moisture supply for crops during occasional periods of protracted drought. Such periods occur in the humid regions of the east and are not locally characteristic of any one section of this country.

In conclusion I desire to thank you for the interest you have shown in this address and to wish you all possible success in the work of home making in this new section of our great state.

Dry Farming Congress

The State Engineer was a member of the executive committee of the Third Trans-Missouri Dry Farming Congress and attended this meeting as a representative of South Dakota. The congress was held at Cheyenne, Wyoming, February 23-25, 1909; it was well attended and successful in every respect. As an evidence of the general interest now being taken in dry farming there were in attendance, besides the regularly accredited delegates from the several states, special representatives from several foreign nations, including Australia, Brazil, Canada and the Transvaal. Seventeen states besides the territories of Arizona and New Mexico sent delegates to the congress; some of the delegations were strong numerically and all contained representative, well informed men. The United States Department of Agriculture was ably represented by delegates from Washington, D. C., and also from various experiment stations in the western states and territories.

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The State Engineer delivered an address to the congress, the title being, "Progress of Dry Farming in South Dakota." This address will not be given here but it is thought the following extract will be of interest:

"I do not desire to go on record as an advocate of dry farming to the exclusion of irrigation where same is practicable. As State Engineer of South Dakota my practical work is in connection with the use and application of water for irrigation and other beneficial uses in the western part of the state. Wherever practicable to do so it is advantageous to irrigate land and by such means get the best possible results from the soil. There is, however, a limit to the irrigable areas, even when every acre of irrigable area is taken into account. Fortunately, in western South Dakota we have not reached this limit and there yet remains a vast amount of land subject to irrigation. This land can still be obtained cheaply and there is room for thousands of settlers who wish to take up irrigated farms, and I presume this is the case in other states of our great west. This condition is shown by the immense irrigation projects undertaken by the Reclamation Service, also by those constructed under the provisions of the Carey Act."

The National Irrigation Congress of 1909

The Seventeenth National Irrigation Congress was held at Spokane, Washington, August 9-14, 1909. The State Engineer was a member of the executive committee of this congress and attended same. There was a large general attendance and a number of delegates were present from South Dakota, most of them being from Pennington county.

At my request I was provided with a hall and furnished with a stereopticon and an operator for exhibiting lantern slides. I gave an illustrated lecture on South Dakota, showing a number of colored slides and describing scenes from various portions of the state, comprising agricultural operations, power plants, farms, mining, also scenes of the Black Hills.

In addition to this lecture I delivered an address before the congress. The subject being, "Irrigation in South Dakota." This address was intended to call attention to irrigation progress and development in the state, and also to the splendid opportunities for farming and agriculture in general that are now available to settlers.

Waterways Convention

A Waterways Convention was held at Pierre, March 30-31, 1910, for the purpose of considering the development of navigation on the Missouri river. The State Engineer was present and made an address on "Irrigation as Related to Conservation and Navigation."

State Conservation Congress

A Conservation Congress was held in Pierre July 1, 1910, at which delegates were present from all parts of the state. The State Engineer

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attended this congress and spoke on "The Development of Our Water Power."

State Dry Farming Congress

The first meeting of the South Dakota Dry Farming Congress was held at Rapid City, July 18-19, 1910. The State Engineer attended this meeting while in Rapid City on official business. He addressed the congress on "Water Power Development," and the following extract is taken from this speech:

"The most valuable of all natural resources are water and soil. With abuse these great natural assets of the state may be wasted; but with proper care they can be exploited to the fullest extent for centuries and yet remain unimpaired for posterity. No more attractive field for increasing the country's available wealth lies before us today than that of determining the possibilities of our rivers and streams.

"After every pound of coal available for fuel purposes has been consumed and every cubic foot of natural gas has vanished into the realm of things that were; after the world's supply of firewood has been consumed, except such limited quantity as can be obtained from widely conserved forests; after we have become dependent to a large extent for heat and energy upon the direct solar rays, these being supplmented by utilization of the forces of nature in wind, wave and tide movement; there will yet remain the rivers and streams flowing in their eternal course toward the sea. It is then that the mighty forces lying dormant in these moving waters will be fully appreciated and their potential energy utilized to the fullest extent."

The National Irrigation Congress of 1910

The Eighteenth National Irrigation Congress was held in Pueblo, Colorado, September 26-30, 1910. As State Engineer, and therefore deeply interested in irrigation, I felt that it was incumbent upon me to attend the congress, provided time could be found in the busy routine of the department. It so happened that business concerning irrigation required the presence of the State Engineer in the Black Hills in the latter part of September, while drainage work in the southeastern part of the state called for personal attention a little later on. This afforded an opportunity for the State Engineer to go direct from the Black Hills to Pueblo, attend the congress, and return via Sioux City to Vermillion and other points in southeastern South Dakota where drainage work is going on, thence back to Pierre with very little loss of time.

The congress was attended by representative men from all sections of the United States and by delegates from many foreign countries. Matters of national importance relating to irrigation and conservation were discussed and many valuable papers were read. The talks and discussions were of much interest, both home and foreign delegates taking part therein.

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I read a paper before the congress on "The Function of the State Engineer," explaining the working of the Water Code in South Dakota, as a state interested in both irrigation and drainage. I had the honor of serving as a member of the executive committee and also of the committee on permanent organization of the congress.

An irrigation exposition was held in conjunction with the congress. A fine display was made of machinery and agricultural appliances to be used in connection with irrigation farming. I was requested to act as judge in deciding the relative merits of the several exhibits of pumping machinery and to award a trophy offered for the best exhibit of a pumping plant for use in irrigation.

The work of the congress was interesting and absorbing. Such a gathering brings together a large body of men of strong personality, high character and ability.

HYDROGRAPHIC SURVEYS

Under the provisions of the Water Code of South Dakota, the State Engineer is required to make hydrographic surveys and investigations of each stream system and source of water supply in the state, beginning with those streams most used for irrigation, obtaining and recording all available data for the determination, development and adjudication of the water supply of the state; including the location and survey of suitable sites for dams and reservoirs and the determination of the approximate water supply, capacity and cost of each. He is authorized to cooperate with the agencies of the United States engaged in similar surveys and investigations, and in the construction of works for the development and use of the water supply of the state; and is authorized to spend for such purpose any money available for the work of his office.

In compliance with these requirements this department has been engaged in making hydrographic surveys, pursuing this work as diligently as the funds appropriated for that purpose will allow. Owing to the limited funds available for the work it has not been practicable to employ a large field party and the work has been somewhat cramped on this account.

All the hydrographic surveys are made under the personal direction of the Assistant State Engineer, who does the instrumental work in the field, and is responsible for the progress and accuracy of the survey. He is assisted by two field assistants, who are employed during the season when field operations are being carried on and are laid off during the winter months. It is the practice of this department to employ as field assistants recent graduates or members of the engineering class of the State College or the State University. In this way some small degree of assistance is rendered state institutions.

Up to the end of the present season hydrographic surveys have been made of the following streams: Rapid, Box Elder, Elk, Morse, Bear

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Butte, Deadman, Alkali, Rose, Whitewood, Spring, Sandy, Hat, Cottonwood, Beaver and Horsehead creeks. These streams are situated in Pennington, Fall River, Custer, Meade and Lawrence counties. The total amount of work done comprises the following items:

Irrigation ditches surveyed	200 miles
Aggregate lengths of streams surveyed	550 miles
Traverse lines	380 miles
Section lines surveyed	140
Irrigated land	27,000 acres

The information obtained by these hydrographic surveys will be tabulated, and accurate maps will be made of each stream system, showing irrigation ditches, reservoirs, and other works constructed for the application of water to beneficial uses. From this data the State Engineer will be enabled to determine just what amount of water is available for appropriation in any stream which has been surveyed. The extent and availability of irrigable land appurtenant to the stream will also be determined, and the feasibility of water power development can be readily ascertained from this data.

Report of Assistant State Engineer

The work on the hydrographic surveys for the season of 1910 was in the southwestern part of the state in Fall River and Custer counties. The streams surveyed were Hat creek, Cottonwood creek, Beaver creek and Horsehead creek, all being tributary streams of the Cheyenne river.

The purpose of the surveys is to obtain accurate information relating to irrigation and water power for use in the State Engineer's office.

The party consisted of the Assistant State Engineer, and two assistants, D. F. Culbertson and Roy Acheson. Mr. Culbertson left the party September 7 to take up work with the Missouri Valley Engineering Company and his place was filled for the remainder of the season by B. F. Wallace of Edgemont, South Dakota.

Work was commenced upon June 4, 1910, on the survey of Hat creek. The party carried the survey from the point where Hat creek enters the Cheyenne river to the boundary line between South Dakota and Nebraska. Owing to extremely dry conditions and lack of spring rains, there was very little water flowing in Hat creek during the survey, the bed of the stream at times being dry.

There are no irrigation or water power projects on the stream. Irrigation is practiced largely along the dry draws tributary to the creek where flood water is made use of in growing crops of native grasses.

During the survey of Hat creek there were 47.28 miles of traverse line run, 37½ miles of stream and 18½ miles of dry draws surveyed and 34 miles of section lines run.

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At the completion of the survey of Hat creek on July 30, 1910, the party moved to Edgemont, to take up the survey of Cottonwood creek, which empties into the Cheyenne river at Edgemont.

The survey was carried up fifteen miles. The land bordering the stream is rough with the breaks close to the stream. There was one water right located belonging to the Edgemont Ditch and Canal Company, which has been abandoned. On this stream thirteen miles of traverse were run and 11½ miles of section lines.

On August 19 the party moved to A. C. Putnam's on Beaver creek for the survey of that part of the creek which is in South Dakota. The headwaters of this stream are in the Black Hills and the summer flow is not so variable as in the streams on the south side of the Cheyenne. Irrigation is necessary along this stream to procure crops. The crops raised are largely alfalfa and a native hay called wheat grass.

During this survey 10 miles of traverse line were run, 15 miles stream surveyed, 2¼ miles of irrigation ditches and 10 miles of section lines run. Three water rights were located and surveyed; these works irrigate about 200 acres.

On September 9 the survey of Horsehead creek was started. This stream, although normally a running stream, was dry at time of survey. There is some underground flow which shows for a short distance and then disappears.

The valley of this stream has gentle slopes except for about 10 miles from the mouth, where the breaks are close to the stream. The width varies from one to three miles. The soil is fertile loam and with sufficient moisture produces excellent crops. The irrigation systems along this stream are used for native grass and alfalfa, there being about 1,000 acres under irrigation.

On Horsehead creek there were 24.8 miles of traverse run, 41 miles of stream surveyed, 2¼ miles of irrigation ditches and 1½ miles of section lines run and three water rights located.

On the stream a traverse line was run, and stadia shots taken from the instrument stations located the important points for mapping. On the dry draws, however, the stadia method was used exclusively, all distances being read from the instrument by use of the stadia rods.

On October 12 the field party was disbanded and the Assistant State Engineer returned to Pierre to confer with the State Engineer in regard to some reconnaissance work to be done in connection with a reservoir site on Box Elder creek, near Rapid City.

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REPORT OF WATER COMMISSIONER

Belle Fourche, S. D., Oct. 21, 1910.

Samuel H. Lea, State Engineer, Pierre, South Dakota.

Dear Sir: I am forwarding you a list of water rights I have inspected in my district. I found a large portion of these rights in fairly good shape. Almost all of the old reservoirs were badly filled with silt. There is a good number of new works being put in, in this territory that I did not visit, as I knew that they had not completed or started the works. I covered the territory of Hay creek, Upper Belle Fourche river, Crow, Dry, Owl and Indian creeks, townships 8, 9, 10, 11 and 12, ranges 1, 2 and part of 3, and one dam in township 12, range 6. Hay creek is a running stream but 25 miles long, rises in Wyoming and flows east through township 8, ranges 1, 2 and 3, and empties into the Belle Fourche river. There are two large water rights on Hay creek and several check dams, without any rights, having been put in, for the purpose of flooding the meadows. There was one right on the Belle Fourche river taken out by Joseph Weckert in 1896, that has been transferred three times but has not been used for seven years. I also found two abandoned water rights on Grimmett canon. The dams were washed out and the works had been abandoned for a period of seven years. Said water rights are owned by Geo. A. Ross and are located in section 34, township 9 north, range 1 E. B. H. M. Crow creek is an intermittent stream about thirty miles long, rises in Wyoming and flows east through township 10 north, ranges 1, 2 and 3, emptying into the Belle Fourche river. There was one right on Crow creek, besides that of the government, taken out by James Oliver, September 31, 1901. The works had been put in, but were washed out and abandoned. Dry creek is about twelve miles long and flows east through township 10 north, ranges 2 and 3. There are two dams on Dry creek in good repair. Owl creek is an intermittent stream about 40 miles long and rises in Wyoming and flows southeast through townships 10 and 11 north, ranges 1, 2 and 3. Owl creek is free from any works except the government. There was one filing on the creek by Margaret O'Connor in 1902 but has not been put in. Indian creek is about sixty miles long, an intermittent stream, rises in Montana and flows southeast through townships 9, 10, 11 and 12 north, ranges 1, 2, 3, 4 and 5. There are no filings or works on Indian creek, that I could find. The water sheds between these creeks are covered with rights and completed works. There is a great deal of work being done this fall in the way of new works and the repairing of old.

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REPORT OF WATER COMMISSIONER OF WATER DIVISION NO. 1, SOUTH DAKOTA

List of Water Rights

Location of Headgate			Date of Filing			Name of Owner	Condition of Works	Remarks
Sec.	Tp.	R.	Day	Mo.	Year			
NW¼ NW¼ 8	10	1	30	6	1900	William Barbour	Washed out	Ghost creek
SW¼ SW¼ 26	10	1	..	..	1908	Frank Sinclair	Incompleted	Dry draw
N½ 32	11	1	29	1	1903	Myrtle Ross	Good	Ross creek
SE¼ 22	11	1	29	1	1903	George Ross	Washed out	Prairie Dog creek
E½ 35	11	1	23	3	1903	C. F. Rowe.....	Not in	Owl creek
NW¼..... 2	11	1	28	3	1903	Mary Rowe	Not in	O'Connor creek
N½ SW¼ 27	9	1	8	6	1903	James Martin	Washed out	Ray creek
E½ SW¼ 31	11	2	..	6	1902	Margaret O'Connor	Not in	Owl creek
S½ SE¼ 30	11	2	3	5	1902	M. F. O'Connor.....	Good	Dry draw
SE¼ 1	10	1	15	8	1900	Patrick O'Connor	Good	Slick creek
NE¼ 10	10	2	18	12	1901	John Brant	Good	Salt creek
NW¼ 3	10	2	20	3	1903	Charles Brant	Good	Prairie Dog creek
SW¼ NW¼ 26	10	2	No record...			John Brant	Good	Roundout creek
NW¼ 25	10	2	No record...			N. W. R. R. Co.....	Washed out	Roundout creek
SW¼ 5	9	2	23	11	1907	John E. Lindgren.....	Good	Dry draw
SE¼ SW¼ 31	10	2	20	7	1908	Isabelle Lindgren	Good	Oliver creek
W½ SE¼ 7	9	2	31	8	1901	James Oliver	Washed out	Crow creek
SE¼ 25	9	1	No record...			N. W. R. R. Co.....	Good	Box Elder creek
SW¼ SE¼ 17	9	3	23	5	1903	Alson Giles	Good	Dry creek
SE¼ 27	9	3	26	5	1903	Susie and Samantha Bird.....	Good	Dry creek
S½ 11	9	2	No record...			D. Moore	Good	Dry creek
SW¼ 12	9	2	No record...			N. W. R. R. Co.....	Good	Dry Creek
Lots 1, 2, 3.....19	10	3	5	6	1903	Frank Hubbard	Good	
NE¼ NW¼ 24	10	2	5	6	1903	Mrs. E. E. Hubbard.....	Good	Lost creek
NW¼ 9	10	3	No record...			D. Benard	Good	Dry draw
SW¼ 4	10	3	No record...			D. Benard	Good	Dry draw
SE¼ 26	12	1	No right....			N. W. R. R. Co.....	Good	Lone Tree Creek
S½ 20	12	1	No record...			Charley Salom	Good	Lone Tree Creek
SW¼ SE¼ 4	12	1	6	1	1903	Nellie Long	Good	Long creek
SW¼ NW¼ 11	8	2	24	7	1903	J. H. Pearson.....	Not built	Willow creek, running
E½ SW¼ 19	12	6	17	1	1905			
SW¼ NE¼ 15	8	2	1	9	1890	John and Mary Hardwick.....	Good	Springs on Hay creek
NW¼ 20	8	2	9	5	1888	John Scotney	Fair	Check dam, Hay creek

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NW¼ NW¼, SE¼ NE¼	30	8	2	31	10	1908	Maud Richards	Good	Dry draw, three dams
N½ SW¼	24	8	2	1	7	1902	E. D. Richards	Good	Check dam, Hay creek
SW¼ NW¼	21	8	2	24	7	1903	Bert Molton	Poor—washed out	Willow creek
NE¼ NE¼	23	8	1	No filing			D. Richards	Good	Check dam, Hay creek
SE¼ NE¼	22	8	1	No filing			W. W. Fieldsend	Good	Check dam, Hay creek
NW¼ NW¼	21	8	1	No filing			Christ Jost	Good	Check dam, Hay creek
NW¼ SW¼, SE¼ NW¼	28	8	1	7	2	1910	Christ Jost	Good	Dry draw
NE¼	33	8	1	No record			W. W. Fieldsend	Good	Dry draw
SE¼ NE¼	29	8	1	No record			Louise Cates	Good	Dry draw
SE¼ NE¼	30	8	1	No filing			John Call	Good	Dry draw
SW¼	10	8	1	No record			George Couch	Unbuilt	Dry draw
NE¼ NE¼	21	8	1	No record			George Couch	Good	Dry draw
NE¼	10	8	1	7	4	1904	Joseph Counch	Not finished	Taken from lake
SE¼ SW¼	11	8	1	12	10	1907	John Cornell	Good	Dry draw
NW¼	9	8	1	18	11	1903	Homer Couch	Good	Plum creek
SW¼	31	8	1	25	5	1903	Lula A. Buchman	Good	Dry draw
SW¼ SE¼	27	9	1	29	3	1902	George A. Ross	Washed out	Grimmet canyon
SE¼ SW¼	34	9	1	29	3	1902	George A. Ross	Washed out	Not used for six years
SW¼ SW¼	26	9	1	29	3	1902	George A. Ross	Pump not used	Belle Fourche river
E½ SW¼	6	8	2	22	5	1902	Joseph Orem	Not repaired	Lake creek
NE¼ NE¼	22	9	1	14	7	1902	T. K. Slaughter	Good	Dry draw
N½	14	9	1	24	2	1902	Hobart Schreyer	Not in	Hay creek
NE¼	30	9	2	24	7	1908	Mary Johnson	Incompleted	Dry draw
SE¼	30	9	2	No filing			J. Johnson	Good	Dry draw
SE¼	25	9	1	No filing			N. W. R. R. Co.	Good	Dry draw
SE¼ SE¼	17	10	1	20	12	1904	Luther Kendrick	Good	Stewart creek
SW¼ SE¼	17	10	1	21	12	1904	Luther Kendrick	Good	Kendrick creek
SW¼ SW¼	18	10	1	7	7	1909	John Zorckling	Good	Carlew creek
NE¼ NE¼	19	10	1	No filing			William Benson	Good	Dry draw
SE¼ NE¼	18	10	1	No filing			Belle Stephens	Good	Dry draw
NW¼ NE¼	8	10	1	No filing			William Stephens	Good	Dry draw

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TOPOGRAPHIC SURVEYS

Some years ago the United States Geological Survey did considerable work in this state in the way of making topographic surveys and maps showing the nature and resources of the state. In recent years, however, this work has been discontinued and the State Engineer has endeavored to ascertain the cause for such action and also to find some way of having this work resumed. Information has been received that the United States Geological Survey will not make additional topographic surveys in a state except in co-operation with the state. The conditions of co-operation are that the state funds only become available providing there is an equal amount expended from the federal appropriations on the work within the state. The work is executed entirely under the direction of and by the United States Geological Survey in conformity with an agreement entered into with the state.

A topographic map is essential as a basis for the representation of the nature and resources of the state, and is almost essential to the development of the country.

South Dakota has thousands of acres of arid land, now bearing crops of sage brush, that only need water to transform them into productive agricultural lands; it also has thousands of acres of timber land that need intelligent administration to protect them for future generations, but in order to accomplish these ends topographic maps are absolutely necessary to show the location of such areas.

For the development of the mining interests of a state it is essential to have good maps of the mountain regions on which the prospector may locate his claim and learn the distance of same from railroads, and where power may be developed for the treatment of ore.

The question of the storage of the water supply of South Dakota is becoming a more important one every year, and in order to study this problem to the best advantage topographic maps of large areas should be made in order to determine the fall of streams, show where reservoirs may be constructed, and to indicate points where power may be developed and their distance from points of utilization.

In this connection, for the development of power, as well as for irrigation purposes, it is essential that all streams be gaged in order to find out the amount of water that can be depended upon; and to secure reliable data it is necessary that these gagings be extended over a series of years. This part of the work is in charge of the water resources branch of the United States Geological Survey, and is being prosecuted as rapidly as small appropriations will permit.

In the eastern part of the state large areas require drainage to render them suitable for agricultural purposes. In some sections, on account of the natural formation of the country, it is difficult to determine the proper route for drainage ditches without close examinations and expensive surveys. In such cases good topographic maps would be of great value.

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The making of a complete topographic map of South Dakota was begun by the United States Geological Survey in 1891, and since that time about 17,814 square miles haave been surveyed, or approximately 23 per cent of the area of the state, which is 77,650 square miles. The quadrangles covering this area, which have been or are in course of publication, are the Ellendale, Columbia, Northville, Aberdeen, Redfield, Byron, Huron, DeSmet, Mitchell, Alexandria, Olivet, Parker, Canton, Elk Point, Belle Fourche, Redwater, St. Onge, Willow Creek, Vale, Deadwood, Spearfish, Sturgis, Rapid, Harney Peak, Hermosa, Edgemont and Oelrichs.

These maps may be obtained from the United States Geological Survey at Washington, D. C., at the nominal price of five cents per copy, or $3.00 per hundred.

GOOD ROADS

Matters relating to public roads in this state do not receive the attention they deserve, in view of their importance as affecting the public welfare. There is an entire lack of system as regards any general plan for improving and maintaining the roads of the state, the result being an uneven condition of road construction and maintenance.

The control of the highways of the state is vested in county commissioners or other local authorities and, as a natural consequence, there is but little expert work done in the way of maintaining or improving the public roads. This method of caring for our public roads results in much diversity of modes of building and repair. Various opinions and ideas of officials charged with road business and who, in many instances, have had no proper training in road work, as their previous labors were applied along other lines, result in too many plans for the work. In numerous instances, men have charge who make good and substantial progress in their work but for local causes are superseded by others holding completely divergent ideas. There are also local influences so potent in shaping the road expenditures as to often prevent good and permanent results.

It is believed, however, that a better condition of affairs concerning public roads in the state may soon be expected, and that suitable legislative action will be taken to provide better road laws for South Dakota. The attendance at the State Good Roads Convention at Aberdeen, October 26-27, 1910, is an indication of growing public interest in good roads. It is hoped that much good will result from this convention and also from the efforts of the men who are devoting their time and attention to the subject.

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FORESTS

The forest areas of South Dakota are situated principally in the Black Hills, although there are isolated tracts of timbered land among the buttes or hills found in the northern part of Butte county. The Cave Hills are near the northwest corner of the state, and southwest of these are the Short Pine Hills, consisting of two nearly parallel ranges, four to six miles long, running north and south. The Slim Buttes, situated near the center of the county, form an L-shaped ridge, extending 25 or 30 miles, with a breadth of 0.5 to three miles. These hills are more or less supplied with timber, the red pine growing abundantly in the ravines and on the slopes and showing above the summit plains.

Outside of this region the most important timber lands occur on the bottom lands in the bends of the Missouri river and on the islands in that stream. Single tracts of timber rarely exceed 1,000 acres, although a few much larger tracts occur near the southeast corner of the state, but these are rapidly disappearing. Cottonwood, elm, cedar, butternut and ash are the most common varieties. The National forest reserves in the state, as defined in bulletins of the United States Forest Service, consist of the Black Hills National forest and the Sioux National forest. The former comprises 1,163,160 acres, situated in the Black Hills region. The latter is a consolidation of the three small forest areas as follows: Cave Hills, having an area of 23,360 acres; Short Pine, 19,040 acres; and Slim Buttes, 58,160 acres; total area, 100,560 acres. The two National forests contain in the aggregate 1,263,720 acres.

The principal source of water supply in the western part of South Dakota comprises streams that originate in the Black Hills and within the limits of the National forest reserves. Under former conditions these forest areas were being fast devastated by various agencies and there was grave danger of a serious depletion of the timber supply of the state. This would have been disastrous in the extreme, for with the destruction of these forests not only would the local timber supply have been cut off, but the water supply would have been seriously diminished, thus injuriously affecting irrigation interests and water power development.

Under the wise and efficient administration of the Forestry Bureau, the preservation and continuance of these forest areas is assured and there is a practical certainty of an undiminished flow of the streams adjacent to the Black Hills. This will guarantee a water supply for irrigation as well as for water power development in this section. It is to be hoped that additional areas among the higher lands comprising the watersheds of other important streams will eventually be forested and thus aid in furnishing a more evenly distributed flow of water.

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CONSERVATION OF WATER

In the process of irrigation development in our western states it is usually found that as the irrigated areas become larger and the demands upon the sources of water supply increase, there comes a time when the matter of securing additional reclamation facilities becomes a very serious question.

In the case of streams whose waters are not diverted from their channels for purposes of irrigation, but which are useful as sources of water supply for other beneficial purposes, the matter of regulating the stream flow is of much importance.

There are various methods that may be employed for obtaining the greatest efficiency from available water supplies, among which the most important are the prevention of waste and the storage of flood waters.

WASTEFUL USE OF WATER

In all localities where irrigation is practiced there is more or less waste of water. In the canal systems and ditches which supply farms a large proportion of the water flowing through them is lost by absorption and seepage. As water for irrigation becomes more valuable a higher duty will be required, and this can be attained only by making the ditches water-tight by lining the channel with some impervious material, such as concrete, plaster, clay, or crude oil.

Greater care will become necessary to prevent the over-irrigation of crops, which is a common cause of waste. Many farmers seem to think that because the application of water is beneficial to crops the more water they use the better results they will obtain and proceed to drown their crops with too much water. Others allow the water to run freely without attention, the result being great waste. By the exercise of careful supervision these sources of waste may be eliminated with the result that a much larger area will be irrigated from a given source of water supply.

STORAGE OF FLOOD WATERS

There are thousands of acres along the streams in the western part of the state that are unproductive because of lack of water. At the same time in all these streams immense volumes of water go to waste during the flood seasons. The obvious remedy for this condition of affairs is the construction and maintenance of large storage reservoirs for holding back this water. The irrigation of 100,000 acres of land is made possible under the Belle Fourche project by storing the flood waters of that stream.

The development of irrigated farming in this state will sooner or later reach a stage where the construction of storage reservoirs on

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streams will become an important factor. Where the stream is one of considerable size numerous irrigation canals will be constructed from it, and its entire normal flow will then be utilized and means will be provided for holding back the immense volume of water which goes to waste during periods of high water, so as to render it available for use in the drier parts of the year. By such means many large tracts of non-productive land will be reclaimed.

An example of the utility of water storage in streams that are not used for irrigation is cited in the Bix Sioux river, a stream that is subject to great fluctuations in flow.

Big Sioux River

This river has been utilized to a considerable extent as a source of power. The stream, however, is subject to great fluctuations in flow. It has been brought to the attention of those interested that improvements in the flow of the river, principally by means of storing flood water to be subsequently used in eking out the low-water flow, would not only prevent the periodic devastation of lands and destruction of property by floods, but incidentally benefit the users of water power by furnishing more power during the summer and fall months.

This river being a tributary of the Missouri, the interception and storage of its flood waters would be directly in line with the policy of the government of constructing storage reservoirs at the headwaters of the Mississippi river system.

An examination of the Big Sioux river was made in 1900 by Capt. H. M. Chittenden, with a view to the construction of a dam for the storage of surplus water of this stream in Lake Kampeska and Lake Poinsett. A reconnaissance of the basin comprising Kampeska, Pelican and Poinsett lakes was made by the officials of the United States Geological Survey with the same object in view. The following information has been taken from the report of the chief of engineers of the United States army for 1901, and from the Twenty-second Annual Report of the United States Geological Survey:

Kampeska and Pelican lakes are two miles apart, Lake Kampeska being three miles northwest of Watertown. The area of this lake is given on the county map as 5,000 acres; and it is surrounded by steep banks and high lands, except at the east end, where the banks are not more than five feet high. In considering the storage possibilities a height of four feet should not be exceeded. The level of Lake Pelican is about 10 feet lower than that of Lake Kampeska, and the surrounding lands are of comparatively little value. The flooding of these lands, therefore, would not entail serious expense. By raising the water level in Lake Kampeska three feet above the normal and the level of Lake Pelican 13 feet the storage capacity of 15,000 acre-feet in Lake Kam-

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peska and 40,000 acre-feet in Lake Pelican would be obtained. All of this, deducting losses by evaporation, could be utilized during the summer season to swell the discharge of the Big Sioux river.

Lake Poinsett is situated farther down the stream, and consequently has a larger catchment area than the two upper lakes, and can, therefore, control a much larger area than either of the two other lakes, and would have sufficient capacity to store a large proportion of the flood waters of the river. Examinations and surveys have been made to determine the practicability of storing flood waters in Lake Poinsett and also to ascertain the area and capacity of the lake. The area of this lake is about 8,250 acres, and a flood height of seven feet is proposed. The net loss from evaporation and seepage, allowing for the accession from rainfall upon the catchment area, is estimated at 12 inches. This leaves an available storage of six feet, equivalent to nearly 50,000 acre-feet. Taking into consideration the ordinary flow of the stream, it is believed that with a reservoir at Lake Poinsett, as described above, the flow of the Big Sioux river could be so controlled as to produce a near approach to uniformity throughout the year, with a minimum flow of 150 cubic feet per second.

The benefits that would accrue from this proposed storage system would be very great. The floods along the Big Sioux river have been destructive of crops and property, especially in recent years, when they have been of frequent occurrence. Such a storage system would at least hold back the crest of the flood wave and thus prevent a large amount of devastation in the valley, especially in that portion immediately below the reservoir.

RECOMMENDATIONS

The experience of the past four years of the administration of the Water Code of the state has demonstrated that in the main the present laws relating to water appropriations are satisfactory. The recommendations concerning reservoirs that were made in the Second Biennial Report of this department are still applicable, and they will be repeated here.

Reservoirs

The provisions of Section 31 of the Water Code relating to the construction of reservoirs are thought to be inadequate, and it is believed the law should be amended in this particular. It is not claimed that a man shall not have a right to build a dam on his own land for the purpose of impounding storm water. It is thought, however, that any dam of sufficient height to be a menace to life and property below it if improperly built, should be required to conform to the rules of safety and stability. Again, if a person goes to the expense of constructing such a dam, he should be protected in a certain area of watershed above it against subsequent appropriators. This would not necessarily mean that

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a subsequent appropriator on a dry draw would be forbidden to construct a dam on his own land any more than the original appropriator. The rights of the original appropriator, however, should be respected by subsequent appropriators to the extent of allowing him a fair share of the rainfall on a designated drainage area above his dam.

In Sectiono 31, above referred to, is the following clause: "Any person or persons, association or company appropriating the waters of any dry draw or water course within this state shall within sixty days after the posting of the notice hereinafter provided for, build and construct the dam for the purpose of catching and diverting the said waters and proceed with due diligence to divert the same for beneficial purposes."

This requirement is specific as regards work on the dam, but no procedure is designated in case of failure to comply therewith. It is presumed that non-compliance with this requirement will cause forfeiture of any water rights that may have been acquired by the posting of the notice, since such rights could not exist indefinitely without some effort being made to apply them to beneficial use. This presumption, however, is by no means certain and there is much ambiguity concerning the exact construction of the above clause.

It is believed that a law encouraging the storage of water, if enacted along proper lines, will result in the reclamation of many tracts of land that now have an insufficient water supply. Such a law should be so drawn as to interfere in no way with the diversion and use of the annual flow of any stream by prior appropriators, and the use of stored waters should continue under state control as to times and amount of diversion from the streams for storage purposes, and also as to the diversion of stored water for beneficial use.

It is probable that in the course of a few years consideration will be given to every favorable reservoir site available for the purpose of impounding the unappropriated waters in the western part of the state. Many different kinds of dams and embankments will be proposed for construction, and since a defective structure may become a menace to the peace and lives of the people dwelling in the lower valleys, besides causing great property losses, should a break occur, it is important that the state should exercise its police power regarding their construction.

No reservoir or embankment should be commenced before the plans and specifications are approved and a permit for its construction issued by the State Engineer.

Drainage Laws

Much work has been done in the way of land reclamation by drainage in the state under the present drainage laws. Experience in the administration of our Drainage Code has shown many excellent qualities therein as well as some weak points that require strengthening.

While the State Engineer is given a general supervision over drainage matters in the state, he has no authority to correct faulty plans or to prevent the carrying out of poor designs.

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In many cases ditches have been constructed in defiance of good engineering practice and even contrary to the dictates of common sense.

For example, in some localities shallow ditches have been constructed for draining agricultural lands where it was shown by competent engineers that such ditches would be entirely inadequate for the purpose intended. Money spent for work of this nature is practically wasted, for such work will generally have to be done over at a later period.

The State Engineer, having been vested with the general supervision of drainage operations, should be authorized to pass upon drainage plans and construction work executed under the provisions of the Drainage Code of the state. A provision should be inserted in the drainage law to the effect that plans and specifications for all drainage work should have the approval of the State Engineer before they become legal and binding. In this way the services of an expert engineer who is interested in the success of the work can be obtained at a nominal cost and the best and most economical results assured.

APPROPRIATIONS

This department has been conducted with due regard to economy in expenditure and efficiency in operation since its establishment, and pride is taken in the amount and quality of work accomplished.

The office and field force has not been increased in the last two years, although the work of the department has practically doubled during that time. It is a satisfaction to realize that all of the work has been taken care of promptly and that no part of the official duties have been slighted. The faithful and efficient work of the members of the departmental staff and the deep interest taken by them in the performance of their duties afforded these gratifying results.

The work of this department is steadily increasing in importance and volume and, in order to maintain the present high standard of excellence, it is necessary to increase the force to some extent. The rapid growth in population that has recently taken place in the western part of the state is showing results in the increasing number of appropriations of water for beneficial use.

The material advance in farm land values in South Dakota has stimulated interest in the reclamation by drainage of agricultural lands in the eastern part of the state. Since drainage supervision is now one of the duties of the State Engineer, a considerable portion of his time and attention is required for such work. A large proportional increase in office work necessarily results therefrom, requiring additional office force to properly care for same.

In view of the foregoing, it is considered essential for the welfare of the department that provision be made for one additional assistant on

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the engineering staff and one office assistant in addition to the present force. This small proposed addition to the present efficient working force will serve to maintain the present high standard of the department and to increase its usefulness to the state at large.

GENERAL

The State Engineer's department has become a recognized institution, and the work of administering its various duties is steadily progressing. The primary purpose of the creation of the office of State Engineer was the administration of the State Water Code relating to appropriations of water for irrigation and other beneficial uses.

Additional duties and responsibilities accrued when the supervision of drainage was officially delegated to the State Engineer. The scope of the office is at present much greater than originally intended, as far as concerns the extent and variety of matters referred to it, and the tendency is toward further expansion. The State Engineer must confine his official duties to the requirements of the statute, but much work of a public nature has been done by him outside of his regular duties, in the belief that by so doing he was doing a public service and at the same time forwarding the development of a rapidly growing commonwealth.

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